JULY 18, 1955

STEEL

The Metalworking Weekly

Business Trends:

put them to work . . . page 93

No. 6 in 1955 Management Series

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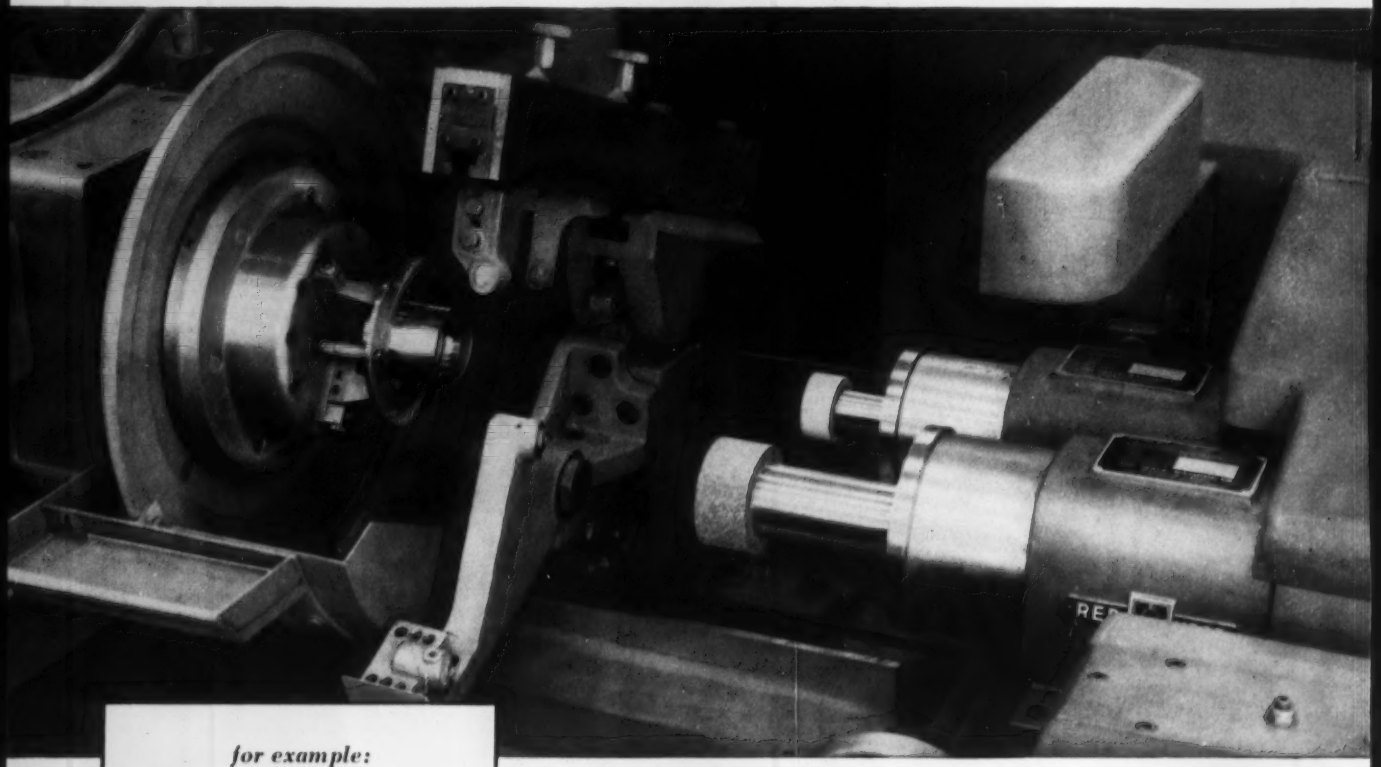
how to convert handling-time into grinding-time with a TWO-SPINDLE HEALD INTERNAL



for example:

This Model 271 Size-Matic grinds

SIX DIFFERENT SURFACES

at a single chucking

Finish grind I.D.—plunge grind bottom face—plunge grind hub face—finish grind O.D. — plunge grind flange face — finish grind flange O.D. *All* of these operations are done, at a single chucking on the Model 271 two-spindle internal shown above. And by reversing the part in the chuck, the same operations (except flange O.D.) are done on the opposite end — a total of 11 different surfaces on one part in one machine!

Fourteen identical machines are used by one manufacturer to grind 34 different gears and gear hubs, with interchangeable workholding fixtures. That's Heald *versatility* in action.

THERE'S no profit in handling-time. Loading and unloading—transferring parts from one machine to another—serve only to cut down the overall efficiency of any precision production operation.

Whenever you can combine bore and face grinding — or bore, face and O.D. grinding—on a two-spindle Heald internal, you convert handling-time into actual *grinding-time*. That means faster, more efficient production by performing two or more operations on a single machine, at a single loading. Moreover, concentricity and squareness between Heald ground surfaces are automatically held to extremely close tolerances.

The versatility of Heald two-spindle internals permits a wide variety of parts to be precision ground on I.D.s, O.D.s and faces in a high-speed, fully automatic cycle. Your Heald representative will be glad to show you how a double-spindle machine can cut costs on your multiple-surface grinding jobs.

it PAYS to come to Heald

Booth 902

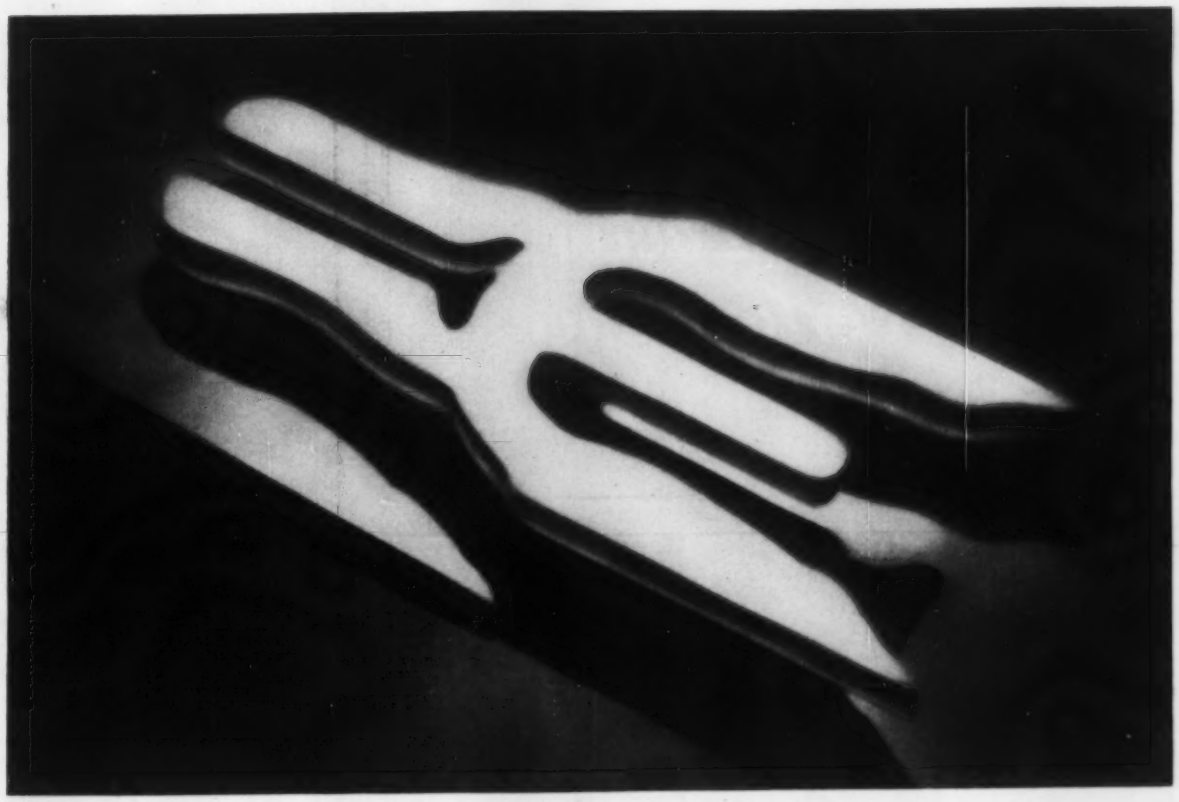
AT THE MACHINE TOOL SHOW

HEALD

THE HEALD MACHINE COMPANY

WORCESTER 6, MASSACHUSETTS

Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York



Making a carbon-steel bar into a heavy-duty garden tool

It's an ingenious process, transforming a flat carbon-steel bar into the complex head of a spading fork.

The Union Fork & Hoe people, who produce a highly popular line of garden tools, start with 14-ft lengths of 4¼-in. x ½-in. bars of C-1095 steel, which Bethlehem supplies to them in substantial quantities for this application.

After the bar has been thoroughly pre-heated, a rough pattern is press-forged—that's the unique five-fingered forging you see above. The four large "fingers" are formed into the diamond back tines by passing them through grooved rolls a *minimum* of forty times. Then the head is reheated and pressed into its final shape, which requires that the two outer tines be turned 180 deg. Next,

the tines are trimmed and pointed, and the head is made concave.

Carefully regulated heat-treatment follows. Naturally, this step is extremely important, because it adds the toughness and flexibility so vital in a spading fork.

The finishing operations include shot-peening, which imparts added surface hardness; polishing for good appearance; and coating with anti-rust compound. Fitted with a strong white-ash handle, the fork is ready to give yeoman service.

Does your product require good, sound carbon-bar stock? Try Bethlehem! We can fill your requirements for hot-rolled carbon-steel bars in standard or special sections, and bar-size shapes. Also semi-finished carbon-steel products: blooms, billets and slabs. For further information, please get in touch with the Bethlehem sales office nearest you.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

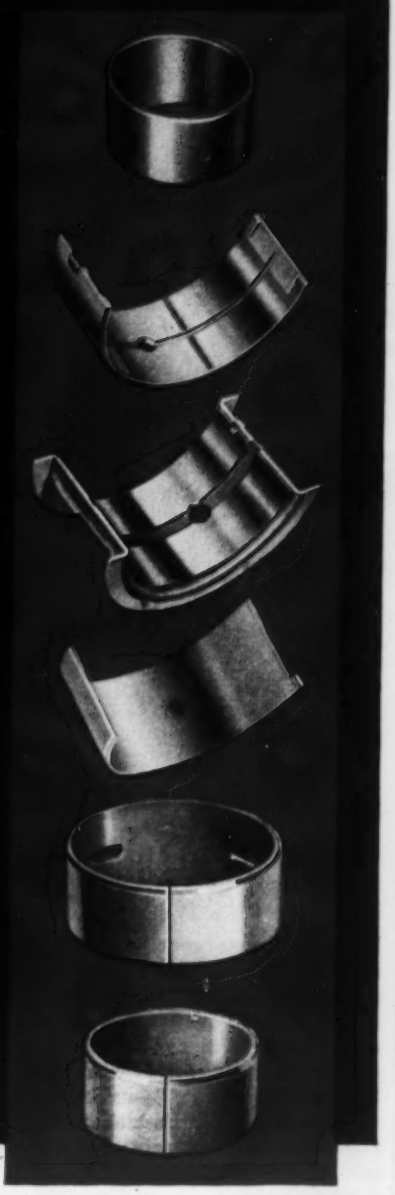
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

BEARINGS...

A Control Factor in Performance!



RESEARCH • DESIGN • METALLURGY • PRECISION MANUFACTURING

Today's trucks owe much of their fine performance to unseen bearings and bushings. Because they "take the rap" of thrust loads from pistons, protect the crankshaft from excessive wear, meter internal lubrication, these high-precision parts are a vital control factor in ultimate performance. We are specialists in quality bearings and bushings for engine, transmission and chassis applications and a major supplier to the truck-building industry. FEDERAL-MOGUL CORP., Detroit 13, Michigan.

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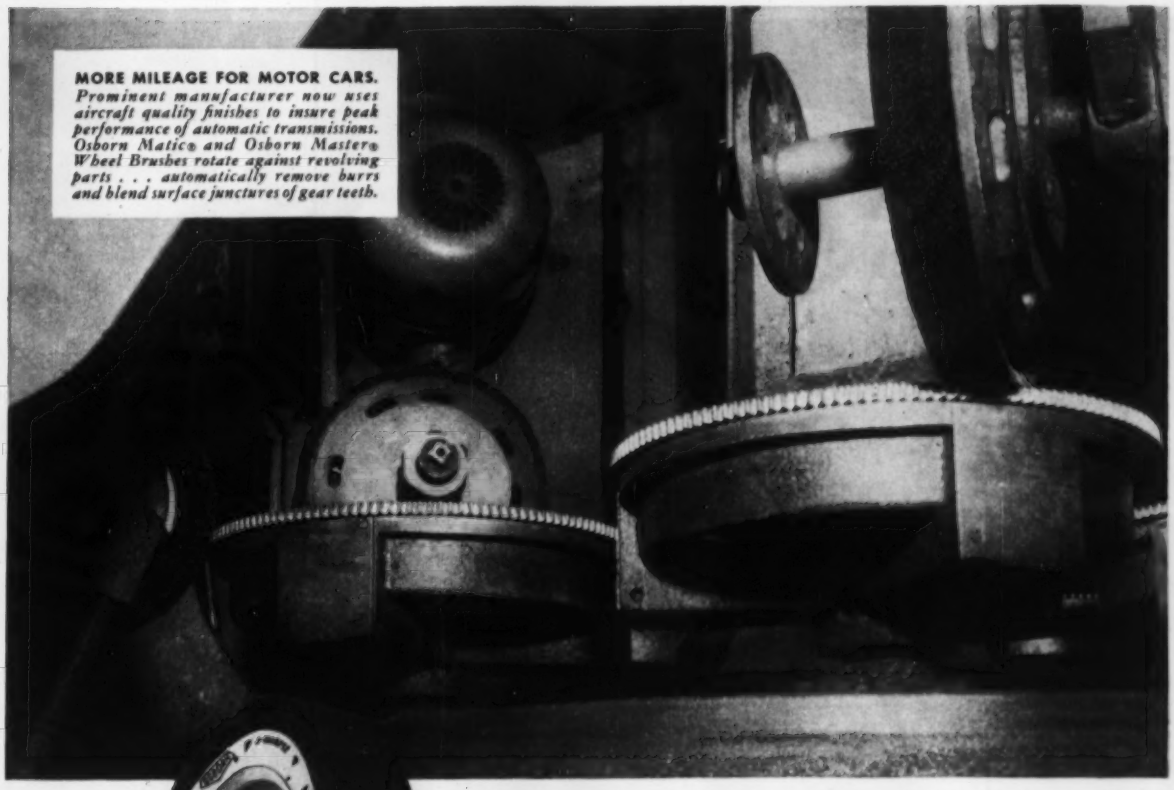
SINCE 1899



MORE MILEAGE FOR MOTOR CARS. *Prominent manufacturer now uses aircraft quality finishes to insure peak performance of automatic transmissions. Osborn Matico and Osborn Mastero Wheel Brushes rotate against revolving parts . . . automatically remove burrs and blend surface junctures of gear teeth.*

Osborn Matico . . . *Industry's Most Efficient Brushing Tool*

FINISHING TOUCH...automatically adds aircraft quality to production

Important benefits an OBA could add to your products

Doubles endurance limits. Records show that sharp corners, tool and grinding marks can reduce endurance limits of machine parts as much as 60%. Many manufacturers of other products now require aircraft quality finishes in the range of 4 to 7 microinches to insure peak endurance on highly stressed parts at maximum economy in production.

Parts are now simply rotated against revolving Osborn Power Brushes on preset time cycles. Sharp edges or surface junctures are uniformly blended, eliminating causes of stress concentrations and possible failure. Small metal particles are removed, avoiding subsequent fouling of hydraulic and lubricating systems.

The power brushing operation is simple . . . requires only loading and removing the part.

Whatever the type of product you build, Osborn Power Brushing can improve quality and cut cost of manufacture. An **OBA**, **O**sborn **B**rushing **A**nalysis, of your job will show you how. Write *The Osborn Manufacturing Company, Dept. G-34, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Osborn Brushes

OSBORN

BRUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES
BRUSHING MACHINES • FOUNDRY MOLDING MACHINES

FORGED TO GIVE CARS STRONG BODIES

● YOU CAN'T JUDGE A ROLL'S STRENGTH BY ITS FINISH.

In the Midvale roll above, both finish and strength are important . . . a hard surface for wear, a smooth surface to give a fine finish on auto body steel, and toughness for durability in cold rolling service. Midvale forges rolls that have both. A half-century of steel-making experience goes into every roll . . . experience in casting ingots, in forging to develop its strength, in heat treating to give it desired properties where needed, and in machining to give it the surface finish.

Of major importance are the tests given the forging at different stages . . . tests to check on composition, structure, hardness, strength and dimensional accuracy.

The same is true of every Midvale product . . . rolls for steel or paper mills . . . forging and alloy castings for heavy machinery, reduction gears, hydraulic presses, turbine machinery, press cylinders and high pressure vessels.

You name the purpose . . . we'll supply the roll . . . of hardened and ground alloy or stainless steel.

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Offices: New York, Chicago, Pittsburgh, Washington, Cleveland, San Francisco

MIDVALE

FORGINGS, ROLLS, RINGS, CORROSION AND HEAT RESISTING CASTINGS

STEEL
The Metalworking Weekly

JULY 18, 1955
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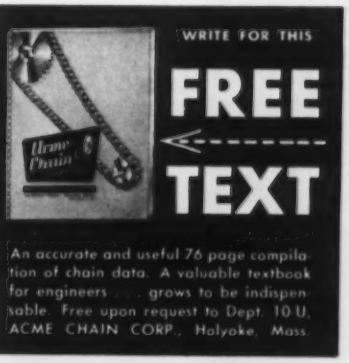
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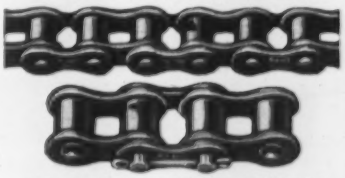
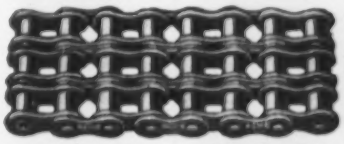
FREE
TEXT
An accurate and useful 76 page compilation of chain data. A valuable textbook for engineers . . . grows to be indispensable. Free upon request to Dept. 10-U, ACME CHAIN CORP., Holyoke, Mass.

COMPLETE PRODUCTION FACILITIES AND PROMPT DELIVERY ON ALL THESE CHAINS

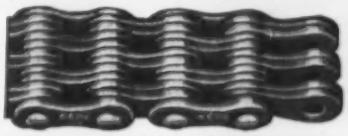


STANDARD ROLLER CHAINS
Available in pitches from ⅜" to 2½" riveted and detachable type.



STANDARD MULTIPLE WIDTH
Multiple widths of six strand or wider available for special application.

DOUBLE PITCH CHAIN
For use in slower speed power transmission and material handling conveyors.



CABLE CHAINS
Acme Cable Chains are furnished in a variety of pitches, widths and strength.

SPROCKETS
Acme Sprockets are available in a wide range of sizes, in all types.

PHONE JEfferson 2-9458.

Acme Chain Corporation

Throughout your plant . . . Buschman "Universal" Cable Conveyors can save you real dollars in handling light and medium loads.

How? Lower initial and maintenance costs than other overhead types . . . smoother operation . . . shorter radius curves and dips permit more complete utilization of space, require less room inside industrial ovens, washers, dip tanks, etc. . . . faster, easier rearrangement.

Investigate the savings possible in *your* plant! Contact your local Buschman representative or write for catalog.

Below: 9½" radius Quick Dip

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CONVEYOR SYSTEMS FOR ALL INDUSTRIES
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behind the scenes

Editor Meets Doctor

At about 3 o'clock on page 16, in 5½ point Ideal type, you will see listed under Editorial Correspondents:

Dusseldorf, Germany . . . . . Dr. Herbert Gross.

Dr. Gross got on the list in June, 1947, when he began reporting for STEEL on German metalworking affairs. Naturally, on his swing through Germany, Editor Irwin Such seized the opportunity to become better acquainted with the good doctor.

"He's a young looking man in his forties," Irwin writes. "He received his doctorate in economics from Kiel University. Europeans with high scholastic degrees use them, and that's why he's called Doctor Gross."

In this connection, it may be of interest to note that business correspondence we receive from Italy, Spain, Mexico and South America is frequently signed by engineers, who use the term as a title. Instead of signing off: Very truly yours, Porforio Notorio, B.S.M.E., Porforio is very likely to write: Your very attentive and affectionate servant who kisses your hands, Engineer Porforio Notorio.

Amazing Versatility

Coming back to our wandering editor, Irwin continues: "Dr. Gross is a prolific writer and author. Each week he prepares and distributes an economic report to several hundred business men. It's called 'Beratungsbrief.' In addition he writes articles and editorials for *Handelsblatt*, a business newspaper published three times a week in Dusseldorf, and which he founded. He has written and published a dozen books on such subjects as 'The Manager of Tomorrow', 'Germany's Comeback in the World Market', 'Modern Public Relations', 'Responsibility of the Business Man in Politics', 'World Trade of Tomorrow', 'Canada', 'New Zealand' and 'Australia'.

He is in great demand as a speaker before business groups in Germany. On July 8, for instance, he talked to the Berlin Chamber of Commerce. He's a great believer in American business and management methods, and promotes them actively. This fall he plans to participate in management meetings in the U. S. Dr. and Mrs. Gross live in a new apartment in Dusseldorf, and have three charming daughters: Ursula, 20, who is studying to be a teacher at Bonn University; Carla, 18, and Gisela, 14, both students in Dusseldorf schools."

Irwin has been traveling so much, observing so much and writing so much on his European industrial pilgrimage he's had very little time to gape at art treasures or exclaim over continental cuisine. However, in one of his latest epistles he mentioned dinner with Berthold Beitz, Managing Director of the famous Krupp empire at Essen. They had specially prepared eggs of the kiebitz bird, a small gull-like bird highly esteemed by Bismarck. It is thought by some that the great curiosity usually exhibited by these little birds gave rise to our word kibitz.

Abbott, to Lee, to Einstein

Our puzzle aficionados (you just ain't in the know these days if you don't use the Spanish term for addict, fan, follower, devotee) have really cornered us. We reported that if all points of an octagon were connected, 608 triangles could be counted. That's the answer the book gave; that's the answer many of our aficionados gave; that's the answer we got. But Director of Metallurgy Robert Abbott, White Motor Co., Cleveland, says there are 632, and he proves it with about one bushel of ciphers and diagrams. We are not qualified to check his terrific presentation, but we have no hesitancy in bowing to his superior judgment. If he says 632, then, brother, it's 632.

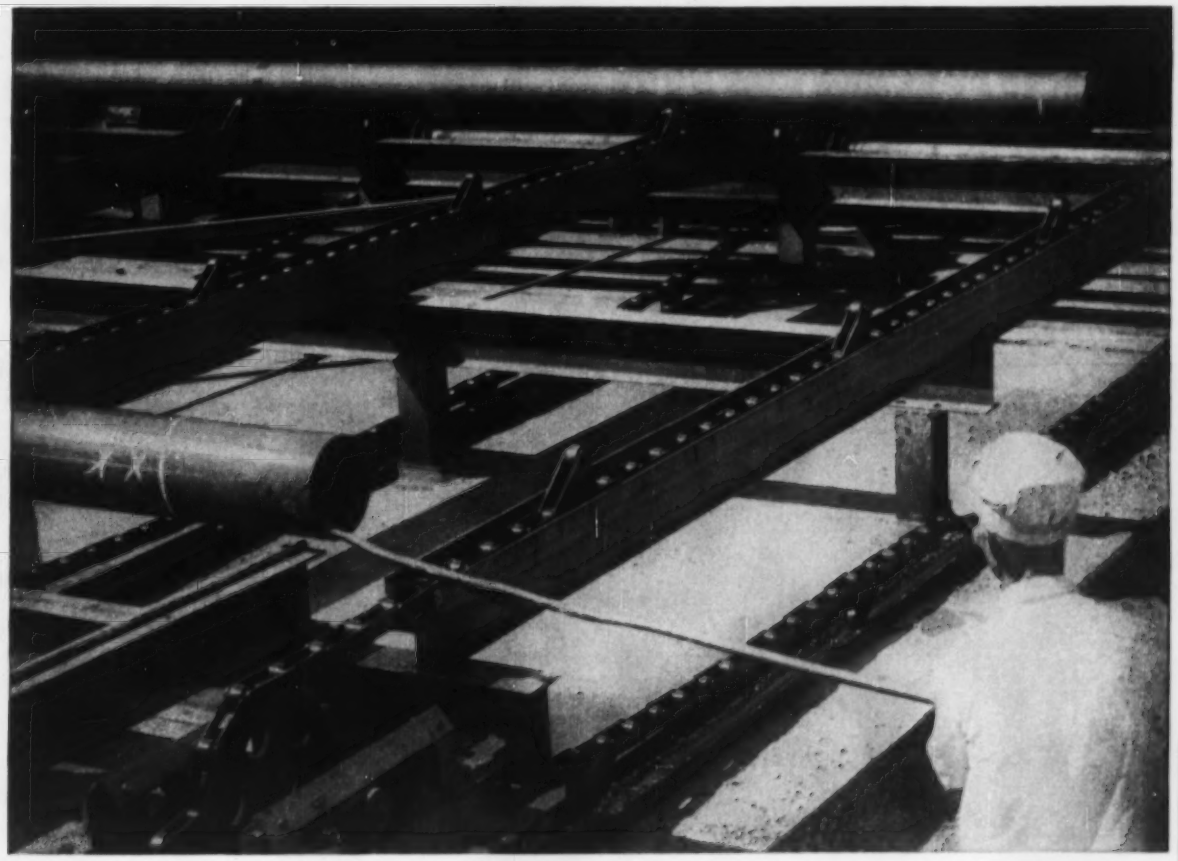
Last week's quotation, by the way, was lifted from an address by Senator Hill, of Georgia. It referred to the South's beloved Robert E. Lee.

No room here for a puzzle, but can anybody remember Einstein's four equations, released to the public in 1949?

Shrdlu

(Metalworking Outlook—Page 47)

LXS is the chain for this job



Transfer conveyor from inspection to cut-off at steel pipe mill uses Link-Belt LXS chain with attachments to move the heavy pipe smoothly.

Heavy loads, impact, exposure— so LINK-BELT LXS is a natural choice at steel pipe mill

Handling 40-foot lengths of pipe that weigh around 1000 pounds each is a job that demands real stamina in chain. That's why the designers of this pipe mill specified Link-Belt LXS.

Use of selected steels plus accurate sizing and close fit of mating parts gives this chain ruggedness and accuracy. *It's the long-life answer for severe conveyor and drive service.*

And the story's the same for every drive and conveyor requirement—you'll find the chain that's *best* for the job in the complete Link-Belt line. No other single source can equal Link-Belt's broad range of roller and silent chain . . . of cast, combination, forged and fabricated types.

Your nearby Link-Belt office or authorized stock-carrying distributor can give you all the facts. Call today.

No ONE chain serves every purpose — get the RIGHT one from Link-Belt's *complete* line

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LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

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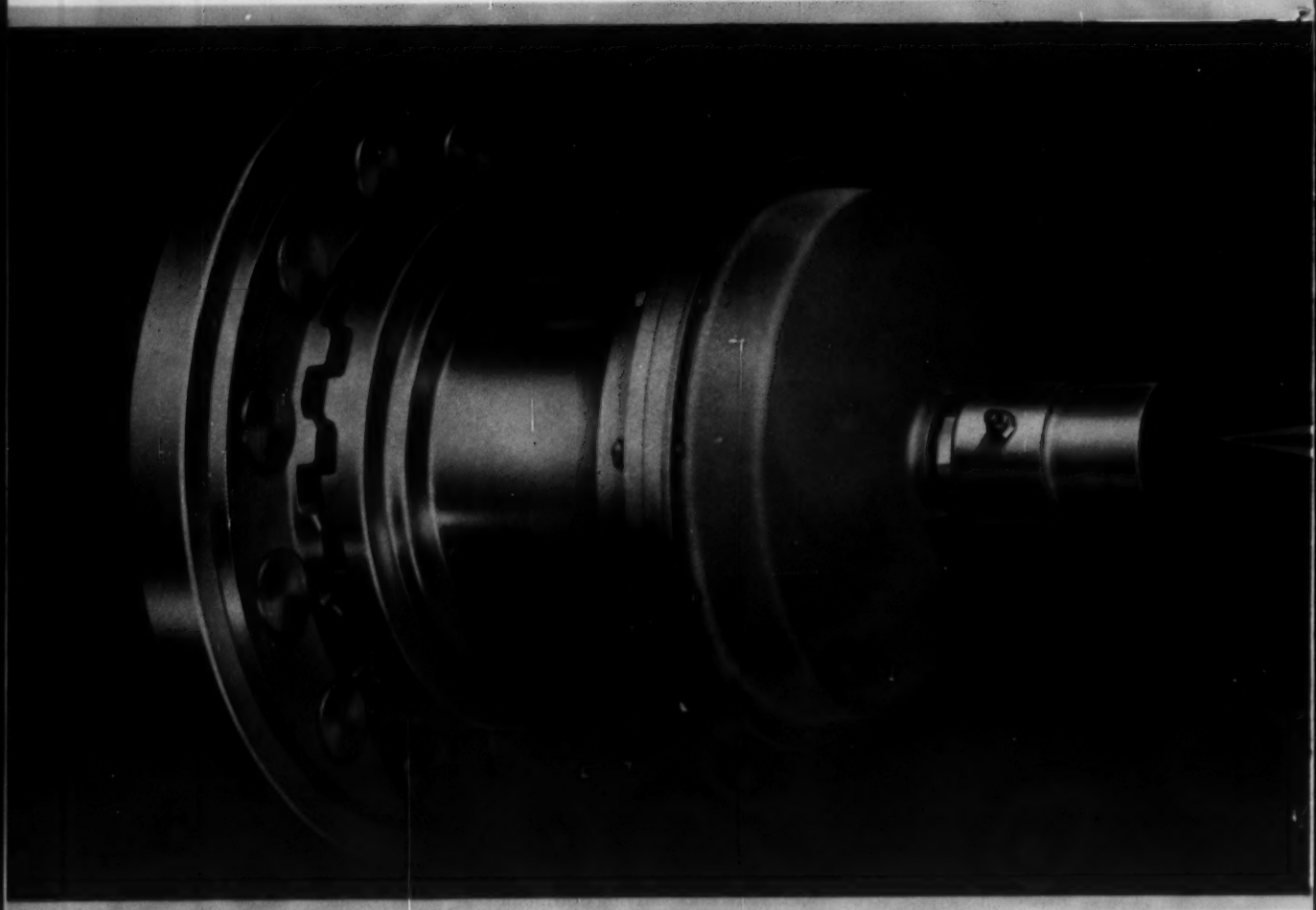
A prime factor in the operating economy



● Examine it. See it operate. Try it yourself. Compare it point for point. The Niagara Electro-Pneumatic Clutch is distinctly superior in every respect: hourly output ... ruggedness ... simplicity ... safety ... savings in operation and maintenance. *It's functionally different in every major detail!*

There, in a nutshell, you have one of the principal reasons why Niagara presses continually out-perform all others. For fact-loaded details, as applied to single or double crank inclinable, gap frame, horn and deep throat presses, request specific literature and consult with a Niagara representative.

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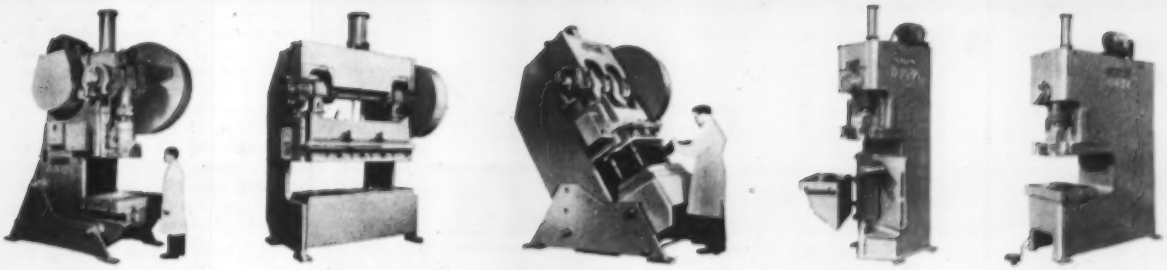
greater output, safety and of Niagara Presses

For Better Performance and Safety

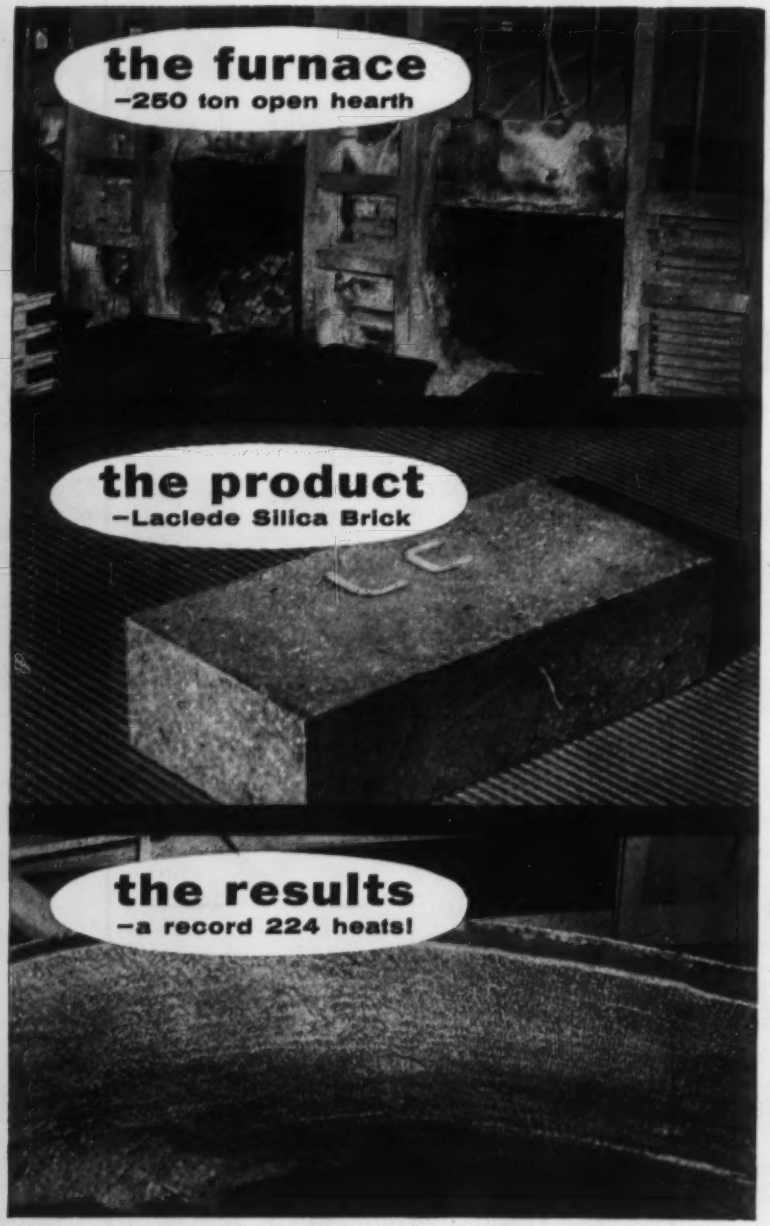
- ENGAGES AND DISENGAGES INSTANTLY at any point in the stroke.
- CAN BE SINGLE-STROKED, JOGGED (forward and in reverse) or operated continuously.
- STOPS INSTANTLY by push button, electric eye, limit switch or similar devices — regardless of crank position.
- PROVIDES EFFORTLESS PRESS OPERATION by palm buttons or foot switch.
- FAILS SAFE. Press stops automatically if electric current or air pressure fails.

For Less Maintenance

- NO FRICTION SURFACES to slip, heat up and wear.
- SIMPLE, COMPACT DESIGN. Nothing to adjust.
- LOW INERTIA. Small in diameter. Operates directly on crankshaft, *the slowest rotating shaft*. No gears nor high speed shafts, etc. to start and stop
- LENGTHENS GEAR LIFE. Wear is distributed uniformly, because engagement load is not always applied to same teeth.
- RUNS IN SEALED BATH OF OIL to minimize wear.
- EASILY ACCESSIBLE. Mounted at end of shaft, external to flywheel.
- NO BUCKING of clutch vs. brake.



America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work



LACLEDE-CHRISTY does it again!

What more can you ask? Laclede-Christy Silica Brick completed 224 heats in the roof of a 250 ton open hearth furnace at a leading midwest steel mill. Based on a year's average, Laclede-Christy out-lasted other silica brick by 27 to 67 heats—for an average savings of *at least* 30%!

Is this the kind of refractory service you're looking for? Your source of supply—Laclede-Christy—is nearby.

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LACLEDE-CHRISTY COMPANY Quality First

LETTERS
TO THE EDITORS

MAPI Formula Inquiry

In the June 20 issue of STEEL, you have an excellent article on "When To Re-Equip" (page 99). In it you mention the MAPI formula. How can I get a copy of this formula?

George Bingham
2411 Webb Ave.
New York

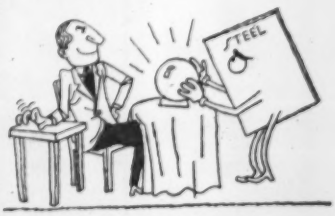
• *Write: Machinery & Allied Products Institute, 120 S. LaSalle St., Chicago 3, Ill.*

Pittsburgh Communicators

We would like 200 reprints of your excellent article, "Business Communication: Put It on Executive-Saving Time" (May 16, page 103). They will be distributed to officers, chairmen and members of the board of directors of our Pittsburgh Junior Chamber of Commerce, most of whom are ambitious young businessmen in our community.

Helledger A. Mims
Commercial Dept.
United States Steel Corp.
Pittsburgh

Crystal Balling



I am writing you in hopes of obtaining the latest information on these points:

1. What is the current rate of replacement for lathes and milling machines.
2. What is the machine tool sales potential for next year? Can you prognosticate a five-year trend?
3. What effect will automation have on the type of machine tools required?
4. Will the turbine-type engine (to be available within the next ten years) have any effect on machine tools?

I realize this is a big order, but if printed answers are readily available, I am sure STEEL will have them.

J. F. Reynolds
Charles Bowes Advertising
Los Angeles

• *We must reply with opinions rather than data, since the figures you request are not available.*

1. Obtaining this figure requires a sales breakdown which is almost impossible to make. We would have to know the portion of total machine tool sales made in the lathe and milling machine field and the percentage of these sales made for replacement rather than for new facilities.

2. STEEL reported in its "Machine Tool Buyers' Guide" (Nov. 16, 1953) that machining capacity was expected to be up 23 per cent by 1960. With that kind of increase, machine tool

(Please turn to page 12)

PREVIEW ITS SPEED, ACCURACY AND VERSATILITY AT THE SHOW!

CAST IRON END PLATES

30 pieces (60 surfaces) per hour; 1/8" stock removed each side; limits ± .002"

ADJUSTING SCREW WASHERS

Low carbon steel; 200 pieces (200 surfaces) per hour; .025" stock removed; limits ± .001"

HOT ROLLED STEEL CAMS

225 pieces (450 surfaces) per hour; 1/32" stock removed each side; limits ± .001"

NOW! BLANCHARD PRESENTS ANOTHER GREAT NEW GRINDER *with Automatic Cycle Control*

When you're at the show, watch this great new Blanchard Surface Grinder perform a variety of jobs with speed, ease and accuracy.

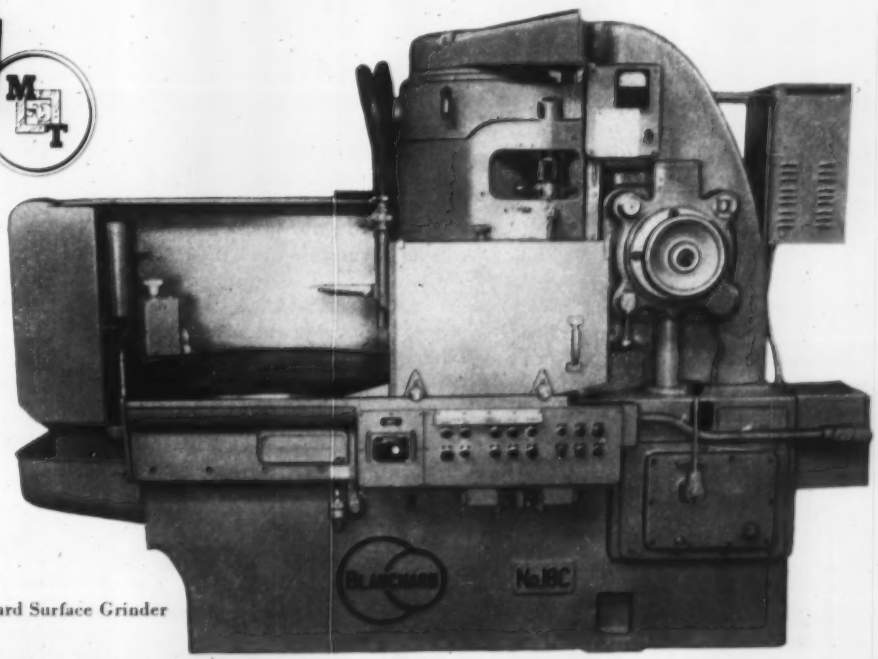
One operator can easily operate two of these No. 18-C grinders under balanced conditions. By using the automatic cycle, he can unload, clean and reload one grinder while the other is grinding.

Here's what the automatic cycle does: moves chuck (30" or 36" dia.) to grinding position and starts it rotating; starts wheel rotation and coolant pump; provides rapid wheel approach to work; engages power down-feed at preset rate; changes to fine feed just before finished size is reached; stops feed when work is to size – "sparks" out; raises wheel head; stops wheel, coolant pump and chuck; moves chuck to loading position – demagnetizes chuck.

This new Blanchard also features: push button selection of manual or cycle operation; size control; simplified feed and head traverse controls; adjustable dwell timer.

THE MACHINE TOOL SHOW
CHICAGO, ILL.

BOOTH 406



No. 18-C Blanchard Surface Grinder

THE BLANCHARD MACHINE COMPANY 64 STATE STREET, CAMBRIDGE 39, MASS., U. S. A.

Why

Crawler Tractors and Torque Converters

are like Bread and Butter!

All Three of the "Big 3" manufacturers of the most powerful crawler tractors available today—*Allis-Chalmers, Caterpillar and International*—use torque converter drive to put power to work more efficiently and profitably than ever before.

Like "bread and butter," torque converters and these mighty new tractors belong together!

Each of the Big 3 has standardized on Twin Disc for torque converter drive crawlers that provide automatic matching of power to load demands—smoother, easier, more flexible flow of power with minimum clutching and shifting—longer equipment life through cushioning of shock loads.

Yet, in each case, Twin Disc worked closely with the manufacturer to develop a torque converter drive package designed especially to fit the individual characteristics of each Big 3 crawler.

Since 1937, Twin Disc has specialized in torque converter drives for all types of powered equipment. Twin Disc engineers *know* power—and how to apply it profitably. If getting the highest possible efficiency out of equipment is *your* "bread and butter," call on Twin Disc for *individualized* application of torque converter drives. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin. *Hydraulic Division,* Rockford, Illinois.

TWIN DISC

TWIN DISC

Torque Converters

LETTERS

(Concluded from page 10)

builders certainly will be busy during the next five years.

3. Automation will affect all machine tools. Users will look for machines that require less handling, will process workpieces faster and more automatically.

4. We have heard no comment on the effect of the turbine-type engine on machine tools.

Reconciliation of Figures

We in the air-conditioning industry are always appreciative of such articles as "Air Conditioning Sales Warm Up" (June 20, page 71), but there is one question I would like to raise.

In the table, you show factory shipments by units. Our figures cannot be reconciled with these.

For instance, actual industry factory shipments in 1953 were only 1,044,691, according to our figures and the Bureau of the Census. In 1954, we showed a figure of 1,230,000. There may be a variation of 25,000 plus or minus, but, in any event, they were not less than 1,200,000.

Your 1954 figure, 950,000, would be an accurate representation of retail sales. But, using retail sales instead of factory shipments, we would have to show a 1953 figure of nearly 800,000 units.

I would be interested in knowing where your figures came from to check them with ours.

George S. Jones Jr.
Managing Director
Air Conditioning & Refrigeration Institute
Washington

• *Our 1950 and 1953 figures are based on factory sales supplied by the Bureau of the Census and published on page 168 in our yearbook issue of Jan. 3, 1955. Variation from your 1953 figure is probably accounted for by later bureau revisions. The 950,000 figure for 1954 is retail sales (based on preliminary bureau estimates). Our 1955 estimate is also retail sales. We should have used factory sales to have been consistent.*

Trend to Automation

We read with interest the article, "Forming" (June 13, page 112), the third in your Machining series.

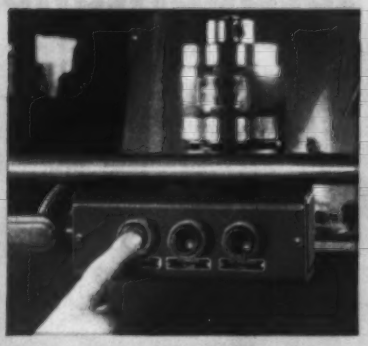
The present trend is automation and extremely high production; consequently, it would be interesting to know the manufacturer of this type of press and equipment.

C. C. Ericson
Purchasing Agent
Rockford Screw Products Co.
Rockford, Ill.

• *The press that had more than a thousand cycles a minute was built by Henry & Wright, Division of Emhart Mfg. Co., Hartford 1, Conn. Since we do not know the size or type press you have in mind, we suggest you contact almost any press builder. They are all building presses for automation and high-production jobs.*

Test cuts eliminated

by accurate performance of CINCINNATI Shears...



The Buttons that save time. The great time-saver—the Cincinnati front controlled Power Back Gauge.

SEE
CINCINNATI
SHAPERS, SHEARS,
PRESS BRAKES
BOOTH 1105

Brown-Wales Company says:

"As a steel warehouse, we have comparatively few production jobs, however, we have found that our men with this new shear can turn out far more work in an hour or a day than they could with the old one. In the first place, the power operated back gauge is a great time-saver when changing, as we frequently do, from one job to another.

"Secondly—the greater accuracy of the shear has made test cuts unnecessary, so that down time between runs is greatly reduced."

Write for Shear Catalog S-6.

Photos courtesy Brown-Wales Company, Cambridge, Mass.

CINCINNATI

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

Seven years service for STANOIL *Industrial Oil at David Bradley Mfg. Works —No down time for lubrication*

L. R. Cummings (left), Standard lubrication specialist, inspects sample of STANOIL, with Robert C. Menken, Plant Engineer of David Bradley Manufacturing Works. Larry Cummings has been serving industrial customers for Standard Oil since graduation from Standard's Sales Engineering School. His mechanical engineering degree from Tri-State College of Indiana qualified him for this work. Customers of Larry's find this experience and background pay off for them.

David Bradley Tri-Trac, handy piece of farm equipment, gives farmer new opportunity for mechanization at low cost. Upper frame on which gasoline tank is mounted, is part formed in HPM press.

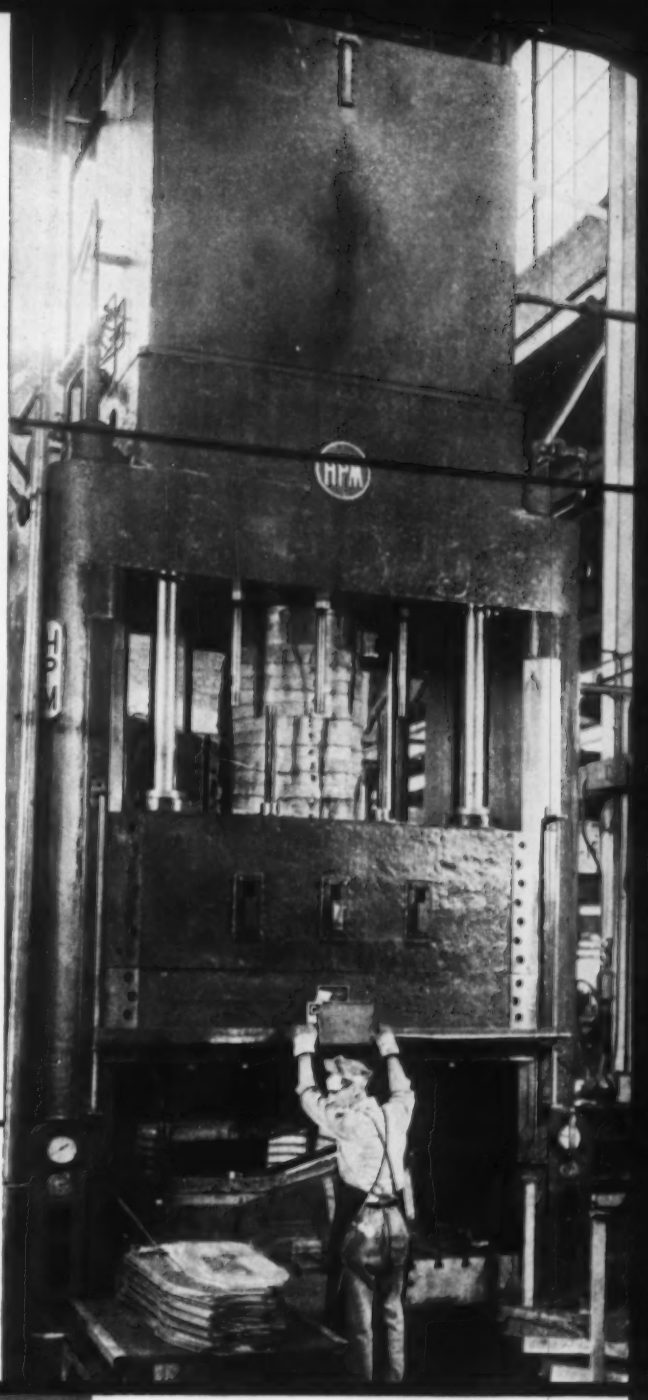
Seven years ago, David Bradley Mfg. Works installed 900 gallons of STANOIL Industrial Oil in an HPM press. There's been no down time required for lubrication maintenance since. A pump by-pass screen filter is the only filtering the oil receives, yet the system continues clean. In March, 1954, an analysis of the oil showed:

Viscosity @ 100°F.—980
Color, NPA — 6
Neutralization No.— .11

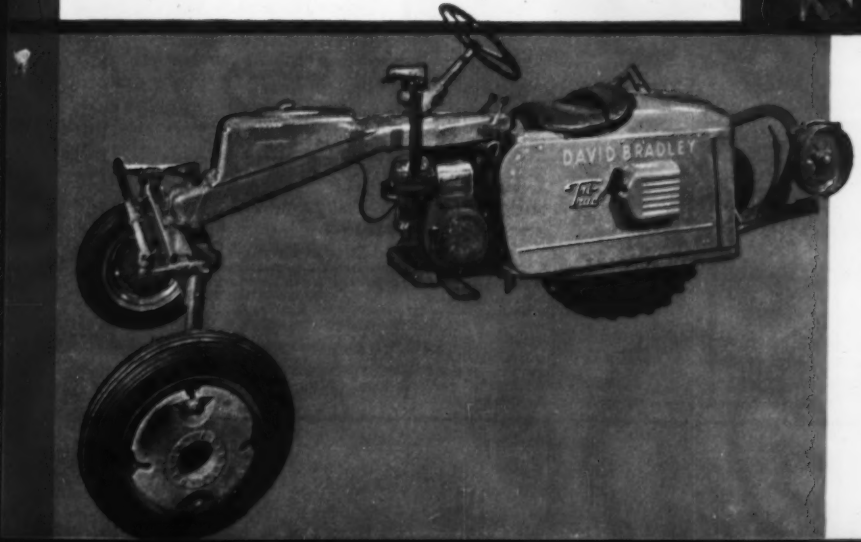
STANOIL Industrial Oil has long been at work for Bradley. Successful operations with it in other equipment caused Bradley engineers to specify STANOIL for this installation.

The HPM double acting, fast traverse hydraulic press reported on here is used to draw the upper frames for the David Bradley Tri-Trac, compact farm tractor. The Tri-Trac is the newest implement in the Bradley line. Bradley has been making farm implements since 1832.

Like to know more about STANOIL? Perhaps it can serve you as efficiently as it is serving David Bradley. Lubrication specialists in any Standard Oil office will be happy to help. In the midwest, a call to one of them will bring a prompt response. Or contact: Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



HPM 500-ton press on the upstroke after drawing upper frame for David Bradley Tri-Trac. Hydraulic system remains clean after 7 years service using STANOIL.



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THE MACHINE TOOL SHOW
CHICAGO ILL.
BOOTH 1413

MASTERLINE GISHOLT SINCE 1887

The Gisholt MASTERLINE medallion will identify this new and improved series of machines to be shown for the first time at the Machine Tool Show in Chicago in September. See them at work in Booth 1413.

PRE-SHOW ISSUE

SINGLE PASS *JETRACER* IS DOUBLE-TOOLED TO SPEED PRODUCTION

Unique Setup on No. 12 Automatic Lathe Cuts Costs on Differential Gears

Jobs like this may open your eyes to some new money-saving ideas with the Gisholt *JETRACER* unit. Here's how this manufacturer does it:

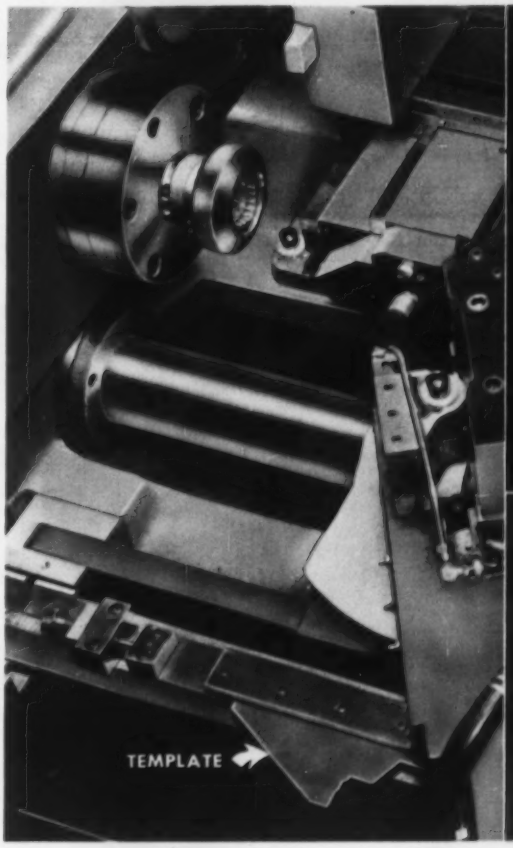
To machine steel forgings for differential gears, two No. 12 Automatic Lathes are equipped with *JETRACER* units, both of which are double-tooled. Gears are held on a segmented-sleeve type air-operated expanding mandrel and driven by a key in the splined I.D. Double-tooling on both tracer slides makes it possible to complete each operation in a single pass.

The line drawing illustrates the first operation. Tool "A" faces the bevel, chamfers the edge and turns the O.D. As tool "A" completes its cuts, tool "B" engages work, facing, co-boring, facing the co-bore and chamfering the corner of the splined I.D. Meanwhile, the rear slide feeds in with a single tool to face the back of the flange and shave-turn part of the hub. Floor-to-floor time is a fast 0.8 minute.

The second operation on the other end is completed in the same manner on the second No. 12 Automatic Lathe, also in 0.8 minute. One operator handles both machines to keep production humping.

It's the combination of smart tooling on the JETRACER unit with the speed of the No. 12 Automatic Lathes that accounts for the swift, accurate production of these parts.

(If you'd like to see more cost-cutting JETRACER *applications, ask for folder —Form 1171.)*



Machining of these differential gear blanks is done with setup shown in drawing. Tools on tracer slide engage in quick succession while simultaneous cut is made with rear slide. Note template for tracer follower at bottom of machine photo.

Layout for 1st operation

Work piece for 2nd operation

At the SHOW:

No. 12 and 24 AUTOMATIC LATHES—See single and multiple passes with *JETRACER* Unit. Three new models; one with full automation.

GISHOLT

TIME-SAVING IDEAS

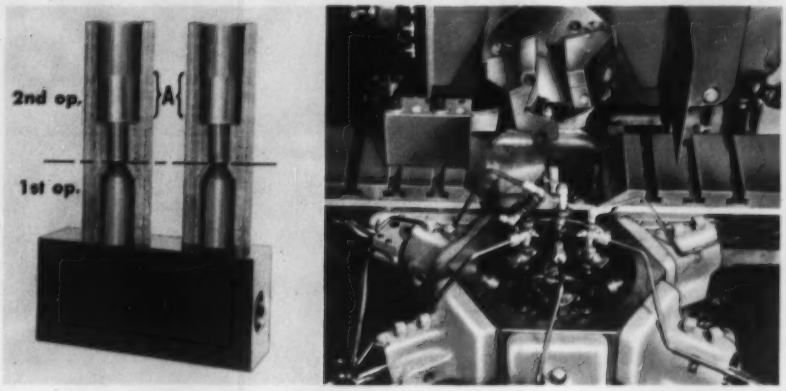
CUTS COSTS BY COMBINING INTERNAL MACHINING AND BURNISHING

Fastermatic Automatic Cycle Is the Answer

To cut costs on these steel block check valve bodies, the producer wanted them internally machined and burnished in two sequential operations on two 1F Fastermatic Automatic Turret Lathes.

By using a special two-jaw air chuck, the job was quickly and simply accomplished. Used for both operations, the special chuck has one stationary jaw, V-block shaped, to locate the work on center, with a dead stop at the rear for longitudinal location. The second jaw clamps the piece by moving in and out.

In the first operation, the valve seat is drilled, formed and reamed; the large bore is taper reamed; and the valve body is faced on one end. Time: 1.46 minutes. In the second operation, the other end of the piece is drilled, bored, co-bored, chamfered and reamed. The operation is then completed by feeding a special turret-mounted burnishing tool into bore "A" to obtain a 20 micro-inch R.M.S. finish. Time: 1.78 minutes.



With a minimum of special equipment, the Fastermatic incorporates the internal burnishing operation as part of the automatic cycle.

Total time for the first operation is only 1.46 minutes, and only 1.78 minutes floor to floor time is used for the second operation—including burnishing bore "A" to a 20 micro-inch R.M.S. finish.

AT THE SHOW:

FASTERMATICS—continuous automatic operation. New setup features make small lot production economical with simple, fast changeover.

TWO CHUCKS ON SADDLE TYPE LATHE HANDLE LONG WORKPIECES

Long oil well drill tubes machined quickly, easily with this setup

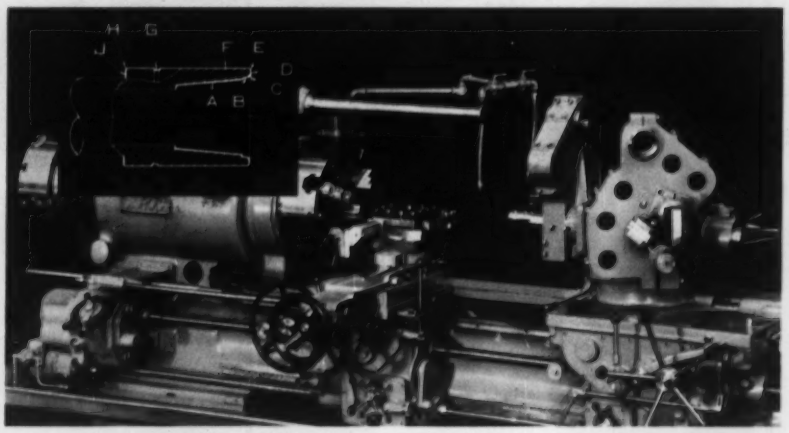
What's the fastest, easiest, safest way to hold an oil well drill tube and machine on end?

Here's one way of doing it:

The long tube is "double-chucked" in a 4L Saddle Type Turret Lathe, using two 24" 3-jaw scroll chucks, one at front and one at rear of the spindle. Result: whip is prevented; distortion is avoided.

Machining is low-cost and simple. First, "D" is faced from the square turret. Next, "A" is step-bored from two multiple-tooled stations on the hexagon turret, which also rough and finish co-bore "B," chamfer "C" and "E" and turn "F." Two more stations on the hexagon then rough and finish taper ream "A," and a special holder on the square turret simultaneously grooves "G," chamfers "H" and faces "J."

"A" is then single-point threaded, using the full-length lead screw and a special taper attachment cam on the square turret carriage. This completes the job.



Machining long workpieces without whip and distortion is simple, fast and easy with this two-chuck setup on a Gisholt Saddle Type Turret Lathe.

AT THE SHOW:

SADDLES—new higher speed, more powerful machines. *JETRACER* will be demonstrated on both bridge type cross slide and hexagon turret mounting.

THE MACHINE TOOL SHOW

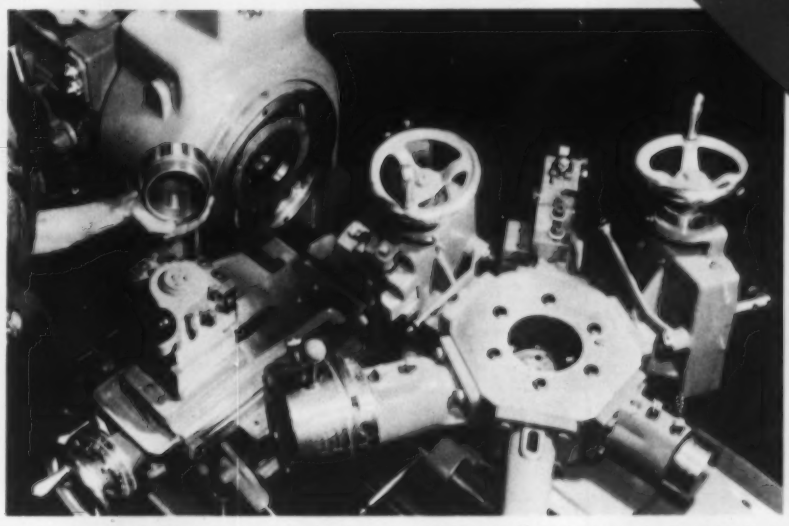
BOOTH 1413

HERE'S EXTRA SPINDLE BORE CAPACITY WITH OUTSIDE-OPERATED COLLET CHUCK

Here's a good idea to keep in mind: You can work right up to the limit of your spindle bore capacity. This producer is doing it with his Gisholt No. 5 Ram Type Turret Lathe, tooled to machine threaded adapter bushings from 4⅜" seamless steel tubing. An outside-operated collet chuck does the trick.

Tooling is also well planned. Parts are finished in minimum time—only 4.2 minutes floor to floor. Hexagon turret tools bore, co-bore, turn, form, chamfer, thread the O.D. and tap the I.D. Square turret tools face and chamfer with cut-off from the rear tool post.

An outside operated collet chuck arrangement provides the extra capacity needed to complete this job and permits using a smaller, less expensive machine.



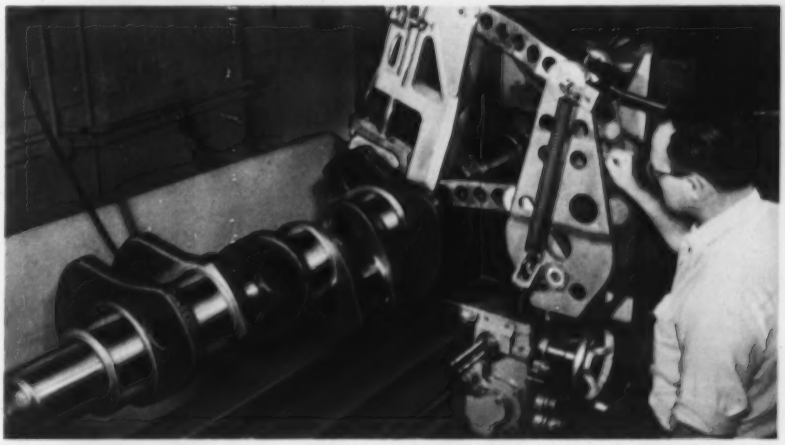
AT THE SHOW: See new Ram Type models, including the 4½" spindle bore No. 5. Also, first showing of the new Electram for high-speed, automatic operation on small parts.

HOW TO SUPERFINISH CRANKSHAFT BEARINGS ON A LATHE

No. 4 attachment makes possible smoother surfaces with very small investment

Even on limited production, you can take advantage of the benefits of Superfinishing. Attachments can be mounted on your own lathe, thus saving the cost of a special machine. In this case, large diesel engine crankshafts, main and pin bearings are Superfinished in one operation. Costs are held low by a Superfinishing attachment with a special latch-on type, follower-arm.

Nine bearing surfaces are Superfinished with four minutes stone contact time per bearing and one minute to position the attachment for the next bearing. A final surface finish of 3 to 5 micro-inches R.M.S. is attained, compared to 25 to 30 micro-inches R.M.S. before Superfinishing.



This special Superfinishing attachment on existing equipment eliminates polishing and lapping operations to insure better crankshaft performance.

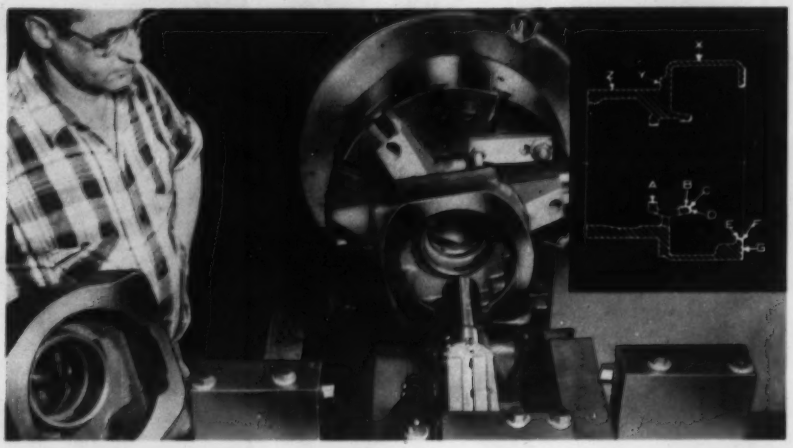
AT THE SHOW: SUPERFINISHERS—machines working continuous runs and job lots. Demonstrations to show reasons for Superfinish and how to control size.

GISHOLT

TIME-SAVING IDEAS

AWKWARD GEAR HOUSINGS HANDLED EASILY THROUGH SMART TOOLING

Simplimatic setup with 9 tools, bores three diameters simultaneously



The manufacturer of a well-known farm tractor line had a problem in machining the awkward cast iron gear housing you see here. Smart tooling and the Gisholt Simplimatic Automatic Lathe are proving the answer.

The operator sets the rough workpiece on a special angle plate bracket providing a loading rest. This bracket also serves as a work-driver. Work is then placed against jacks at "Y" and chucked on the long hub at "Z" in a 3-jaw air chuck.

The center slide carries a piloted boring head. This is used for rough and finish boring "A," "B" and "E" as well as chamfering "C" and "F" and facing "D." When this work is completed, the head holds up while front and rear slides rough and finish face "G." This provides complete concentricity for all surfaces and gives excellent finishes free of tool interference.

Through the speed and economy of operation provided by the Simplimatic Automatic Lathe, floor-to-floor time on this job is only 3.4 minutes. Fourteen pieces are produced per hour, with 80% efficiency.

Three diameters are bored simultaneously in awkward workpieces by combining careful tooling with the versatile Simplimatic.

AT THE SHOW:

SIMPLIMATICS—50 h.p. machine on bevel gear blanks. Many new machine features include greater spindle speeds and automatic lubrication to the slides.

BALANCER HAS WELDING UNIT FOR ON-THE-SPOT CORRECTIONS

Correction equipment—either by addition of weight such as operator indicates here, or by weight removal, can be incorporated by any Gisholt Balancing Machine. New Type S catalog, Form #1165, gives complete details.

High Production Setup for Balancing Automotive Flywheels

You know the speed, efficiency and accuracy of manufacturing operations demanded by the automotive industry. Here's how vital balancing of automotive flywheels measures up to these requirements. This Gisholt 1SV1 Static Balancer measures, corrects and inspects these flywheels at a rate of 36 seconds per part.

It's a simple operation. As the flywheel is rotated, the Amount Meter tells the operator exactly how many correction lugs are needed. The strobe lamp, flashing on the numbered dial below the part, indicates where they are to go.

Welding equipment, mounted right on the machine, permits correcting the parts for balance in a single handling. The operator places the correction lug against the upper electrode of the welding gun where it is held magnetically until applied at the indicated angle. Then, a quick check to assure the part is within the prescribed tolerance—and the operation is completed.

Maximum efficiency and accuracy are attained by combining measurement, correction and inspection for balance in a single, fast operation.

AT THE SHOW:

BALANCERS—See actual production runs and demonstrations. Bench, vertical and large-capacity machines in use on static and dynamic balancing jobs.

No. 7-855
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THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

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  —or slit to your specifications

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JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.

FOUNDRY SAVES $32,040 IN ONE YEAR WITH WHITING-THERMO HOT BLAST SYSTEM!

Here is proof that the Whiting-Thermo Hot Blast System makes *big* savings! The following figures show dollar results obtained from an actual installation, accurately measured and controlled:

	BEFORE HOT BLAST	AFTER WHITING-THERMO HOT BLAST
Cost of metal charge	$42.57 per net ton	$42.43 per net ton
Coke	4.55	2.95
Flux	.67	.28
Gas fuel for blast preheater	(none)	.20
Misc. charges		.15
TOTAL	$47.79	$46.01

SAVINGS per net ton **$1.78**
SAVINGS (72 ton/250 days) per year **$32,040.00**

The Whiting-Thermo Hot Blast System employs a separate fired air heater, precisely controls air blast temperatures up to 1000°F. and makes available almost instant pre-heated air. Large savings in coke, silicon and fluxing agents are provided. The lining does not burn out over nearly as high an area as with cold blast—thus patching costs are reduced about 50%. Melting rates can be increased 10% to 15%, using the same diameter lining. Analysis is more uniform—fewer casting rejects. There is a reduction in oxidation of silicon and less sulphur pick up.

Send for complete information on Whiting-Thermo Hot Blast Systems today!

WHITING CORPORATION
15643 Lathrop Avenue, Harvey, Illinois

WRITE FOR REPORT CONTAINING IMPORTANT INFORMATION ON HOT BLAST.
Ask for Bulletin FO-3

WHITING
FOUNDRY EQUIPMENT

SPECIAL ANNOUNCEMENT

of particular interest

TO EXHIBITORS

at the 1955

MACHINE TOOL SHOW

To help you make the most of your exhibit, E. F. Houghton & Co. has been invited to serve you and other companies operating machine tools, hydraulic equipment and other types of machinery at the show.

We will be on hand before and during the exposition to supply you with the highly regarded Houghton products such as:

- ★ HOUGHTON FORTIFIED LUBRICANTS
- ★ HOUGHTON CUTTING FLUIDS
- ★ HOUGHTON METAL CLEANERS
- ★ HOUGHTON HYDRAULIC OILS
- ★ HOUGHTON RUST PREVENTIVES

To assist you further in keeping exhibited equipment operating smoothly and continuously to best advantage, experienced Houghton engineers will be constantly on call during the show—and beforehand as well.

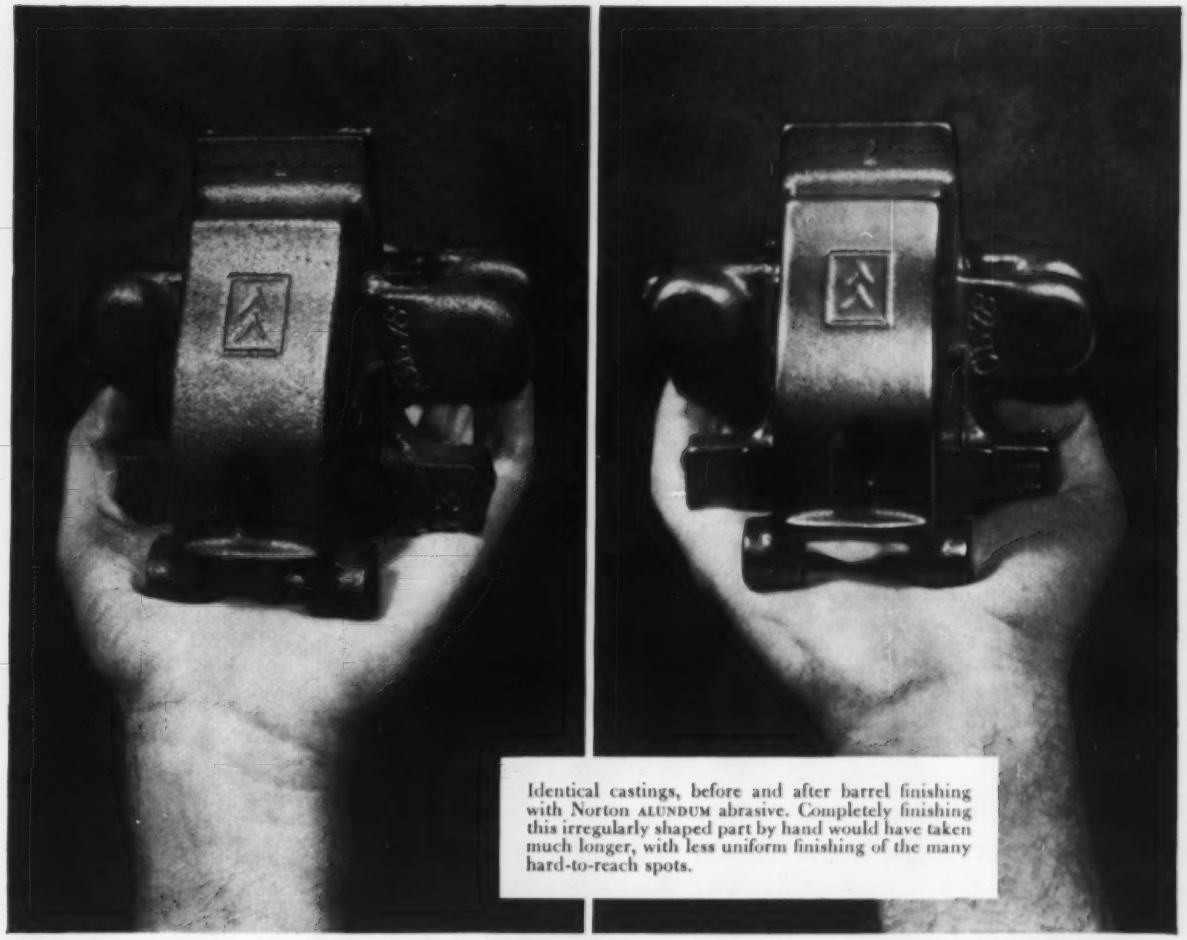
We will also maintain a Houghton service headquarters at the booth assigned to us by the Management, to discuss metalworking problems with the thousands of machine tool users who will attend. Those are the men we are serving in industrial plants over the nation.

To be sure to get the full potential out of your machines on display, we urge you to contact the Houghton Man, or write us at 303 W. Lehigh Ave., Philadelphia 33, Pa. We'll be glad to be of aid in any way we can.

E. F. HOUGHTON & CO.
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

HOUGHTON 1001 PRODUCTS TO IMPROVE PROCESSING



Identical castings, before and after barrel finishing with Norton ALUNDUM abrasive. Completely finishing this irregularly shaped part by hand would have taken much longer, with less uniform finishing of the many hard-to-reach spots.

ALUNDUM* tumbling abrasive tames another tough one!

Intricate parts finished faster, more thoroughly, when Norton abrasive adds the "TOUCH of GOLD"

The trickier, more intricate the parts, the easier it is to see the many advantages of barrel finishing with ALUNDUM tumbling abrasive. Hand finishing the casting illustrated, for example, would have been a long, tiresome chore — and an uneven job at best, due to the many irregularities of shape.

For parts ranging from even heftier castings down to tiny needles, there's nothing like ALUNDUM abrasive to bring out *all* the benefits of barrel finishing. This typical Norton abrasive development is sharp, dense, hard and non-fracturing. Its blocky shape eliminates slivers and chips in the tumbling process. In your tumbling barrels it assures:

- *Highest uniformity of radii and surfaces, with brightest, smoothest finish.*
- *Continual savings of man-hours, by reducing tumbling cycles, scrap and reworking to minimum.*

See Your Norton Distributor

for further facts on how ALUNDUM abrasive can add the time-saving, profit-boosting "Touch of Gold" to your finishing operations. Ask him for the new 55-page booklet on barrel finishing. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your phone book, yellow pages. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass. G281

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

NORTON

Making better products... to make your products better

and its BEHR-MANNING division

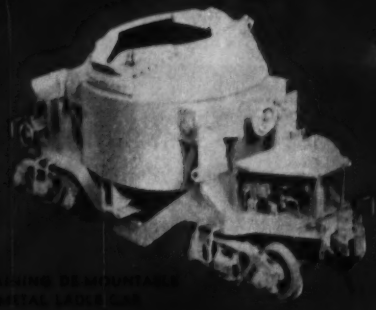
NORTON COMPANY: Abrasives • Grinding Wheels • Grinding Machines • Refractories
BEHR-MANNING DIVISION: Coated Abrasives • Sharpening Stones • Pressure Sensitive Tapes

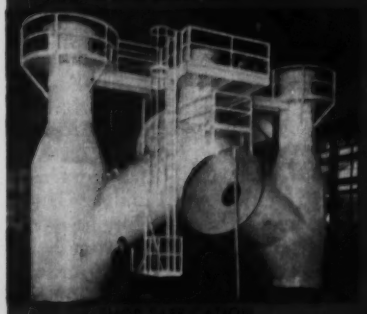
Pollock Experience at No Extra Cost

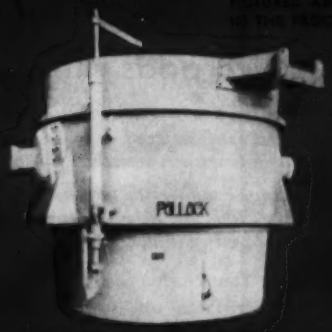
The William B. Pollock Company has been serving the iron and steel industry the world over since 1863.

Pioneers in heavy steel work, Pollock is excellently qualified, equipped and staffed to design and build your special heavy-duty equipment.

Pollock is known for its reliable, efficient precision work. You, too, can benefit from Pollock's broad experience.







POLLOCK
SINCE 1863

THE WILLIAM B. POLLOCK COMPANY
YOUNGSTOWN · OHIO
STEEL PLATE CONSTRUCTION · ENGINEERS · FABRICATORS · ERECTORS

BLAST FURNACES · HOT METAL CARS AND LADLES · CINDER AND SLAG CARS · INGOT MOLD CARS · CHARGING BOX CARS · WELDED OPEN HEARTH LADLES

CALENDAR
OF MEETINGS

July 21-23, Truck-Trailer Manufacturers Association Inc.: Summer meeting, Sheraton-Cadillac hotel, Detroit. Association's address: 710 Albee Bldg., Washington 5, D. C. Managing director: John B. Hulse.

Aug. 15-17, Society of Automotive Engineers Inc.: West coast meeting, Mulnomah hotel, Portland, Oreg. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

Aug. 22-23, Stanford Research Institute and National Industrial Conference Board: Symposium on electronics in automatic production, Sheraton-Palace hotel, San Francisco. Information: National Industrial Conference Board, 247 Park Ave., New York 17, N. Y. Secretary: Herbert Briggs.

Aug. 24-26, West Coast Electronic Manufacturers Association: Western electronic show and convention, Civic Auditorium, San Francisco. Information: WESCON, 344 N. LaBrea Ave., Los Angeles 36, Calif.

Aug. 28-Sept. 1, National Association of Furniture Manufacturers: Furniture supply fair, Conrad Hilton hotel, Chicago. Association's address: 666 Lake Shore Dr., Chicago 11, Ill. Secretary: John M. Snow.

Aug. 31-Sept. 26, World's Fair of Power: S. Lake Shore Dr. adjacent to Soldiers Field, Chicago. Sponsor: General Motors Corp., General Motors Bldg., Detroit 2, Mich.

Sept. 5-6, American Machine Tool Distributors Association: Annual meeting and show, Blackstone hotel, Chicago. Association's address: 1900 Arch St., Philadelphia 6, Pa. Secretary: Thomas A. Fernley Jr.

Sept. 6-8, Industrial Truck Association: Fall meeting, the Greenbrier, White Sulphur Springs, W. Va. Association's address: 526 Washington Loan & Trust Bldg., Washington 4, D. C. Managing director: William Van C. Brandt.

Sept. 6-8, Material Handling Institute Inc.: Fall meeting, the Greenbrier, White Sulphur Springs, W. Va. Institute's address: One Gateway Center, Pittsburgh 22, Pa. Managing director: R. Kennedy Hanson.

Sept. 6-17, Metalworking Machinery & Equipment Exposition: Coliseum, Chicago. Information: Exhibition & Convention Management Inc., 2689 E. Overlook Rd., Cleveland 6, O. General Manager: C. L. Wells.

Sept. 6-17, National Machine Tool Show: International Amphitheatre, Chicago. Sponsor: National Machine Tool Builders Association, 2071 E. 102nd St., Cleveland 6, O. General Manager: Tell Berna.

Sept. 6-17, Production Engineering Show: Navy Pier, Chicago. Sponsor: National Machine Tool Builders' Association, 2071 E. 102nd St., Cleveland 6, O. General Manager: Tell Berna.

Sept. 9-11, Metal Powder Association: Fall closed meeting, the Homestead, Hot Springs, Va. Association's address: 420 Lexington Ave., New York 17, N. Y. Secretary: Robert L. Ziegfeld.

Sept. 11-14, National Metal Trades Association: Eastern plant management conference, Essex and Sussex hotels, Spring Lake, N. J. Association's address: 122 S. Michigan Ave., Chicago 3, Ill. Secretary: Charles L. Blatchford.

Sept. 11-16, American Chemical Society: Fall meeting, University of Minnesota, Minneapolis. Society's address: 1155 16th St. N.W., Washington 6, D. C. Executive secretary: Alden H. Emery.

Sept. 12-14, American Road Builders Association: Annual conference of county engineers and officials, New Riverside hotel, Gatlinburg, Tenn. Association's address: World Center Bldg., Washington 6, D. C. Secretary: Eugene Reybold.

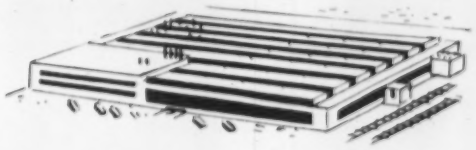
Sept. 12-14, Allied Railway Supply Association: Annual meeting and exhibit, Sherman hotel, Chicago. Association's address: P.O. Box 5522, Chicago, Ill. Secretary: Charles F. Weil.

Sept. 12-15, Automotive Electric Association: Fall meeting, the Homestead, Hot Springs, Va. Association's address: 16223 Meyers Ave., Detroit 35, Mich. Secretary: S. W. Potter.

At your service...

FOR THE PRODUCTION OF

complete machines, assemblies, sub-assemblies, machine parts



If you are faced with the problem of producing machines or parts for which your own equipment is not entirely adequate, you'll find Crown a reliable source for this kind of work. As one of the leading manufacturers of machinery for the soft drink, brewing and dairy industries, Crown has extensive machine shop facilities and a wealth of experience in producing precision parts and assemblies of the highest order. Let us show you how our plant and organization can serve you.

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Baltimore 3, Md.

Send for this book describing our manufacturing facilities now.

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Please send me a copy of the book describing your facilities for manufacturing General Industrial Equipment.

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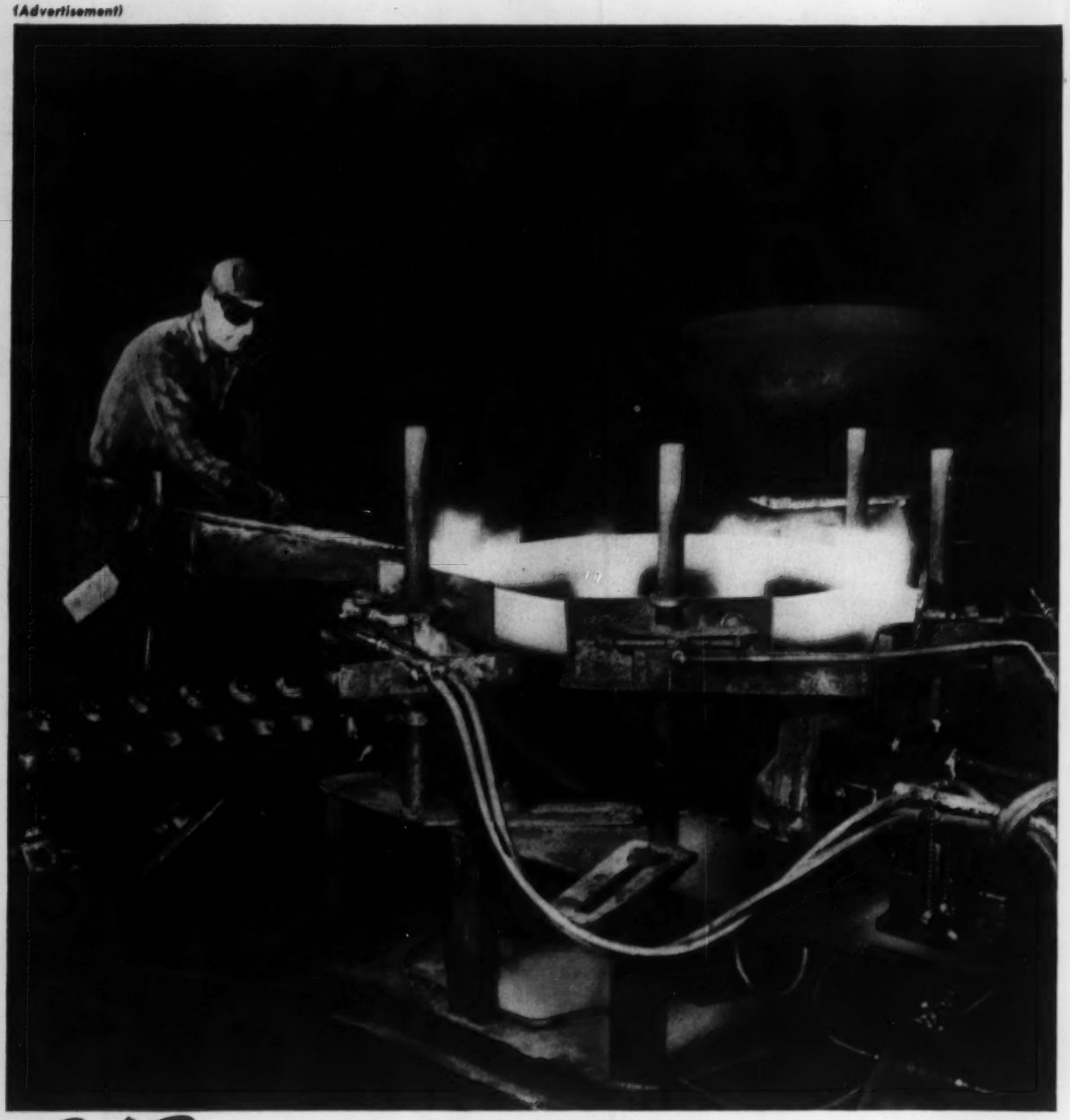
City ..... Zone ..... State .....

(Advertisement)

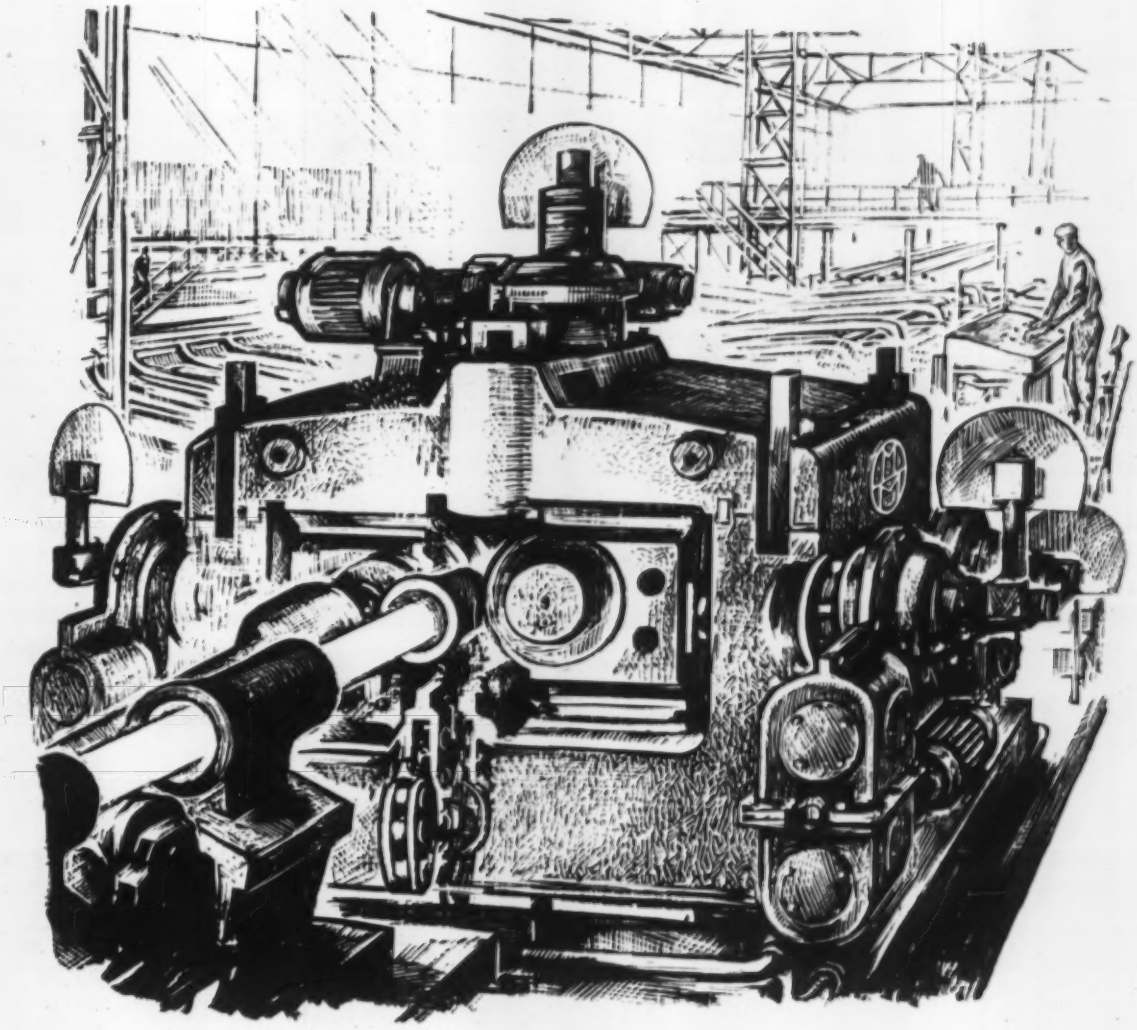


GAS gives new strength to tank heads at Lukens Steel Company

Lukens Steel Company, Coatesville, Pennsylvania, makes a complete line of heads for high pressure LP-Gas storage tanks. For economy reasons, these heads are cold pressed. But cold pressing leaves brittle areas on the head rim. When heads go through the "bumps" and "bangs" of tank assembly, breaks occasionally develop in the brittle area around the head rim.

Lukens solved the problem by stress relieving the heads with Gas. An assembly line conveyor brings the heads to a special Gas-fired machine where a battery of burners stress relieves the entire periphery of the ¼ inch thick head rim. As a result, there are no more brittle areas in the rim. And there are no more breaks during assembly operations.

When you have a problem in your production line involving heat processing, call your Gas Company Industrial Specialist. He'll be glad to discuss the economies and results you can expect from using Gas and modern Gas-fired equipment. *American Gas Association.*



Do You Think Your Reelers Are Heavy Enough?

Most seamless mill operators do not think so! Attempts to speed up production of automatic seamless mills usually are stopped at the reelers because they are not heavy enough to take on more work at higher speeds.– Mannesmann-Meer's modern automatic seamless mills are equipped with heavy reelers of the most advanced design. Working rolls have angular adjustment in both planes to allow for variation of the feed angle which will provide ideal rolling of a wide range of sizes and grades of steel. With Mannesmann-Meer reelers it is possible to roll with an expanding pass and still to get good smoothing action.–

Mill design is considerably simplified by driving each roll with a separate motor. A rugged inlet table design features closed barrel guides to end danger and trouble from split guides. Roller type mandrel bar steadiers make possible smoother reeling operation.– In addition to all of these features Mannesmann-Meer reelers are especially designed for quick schedule changeovers.

Why don't you call us in to see what Mannesmann-Meer's outstanding combination of

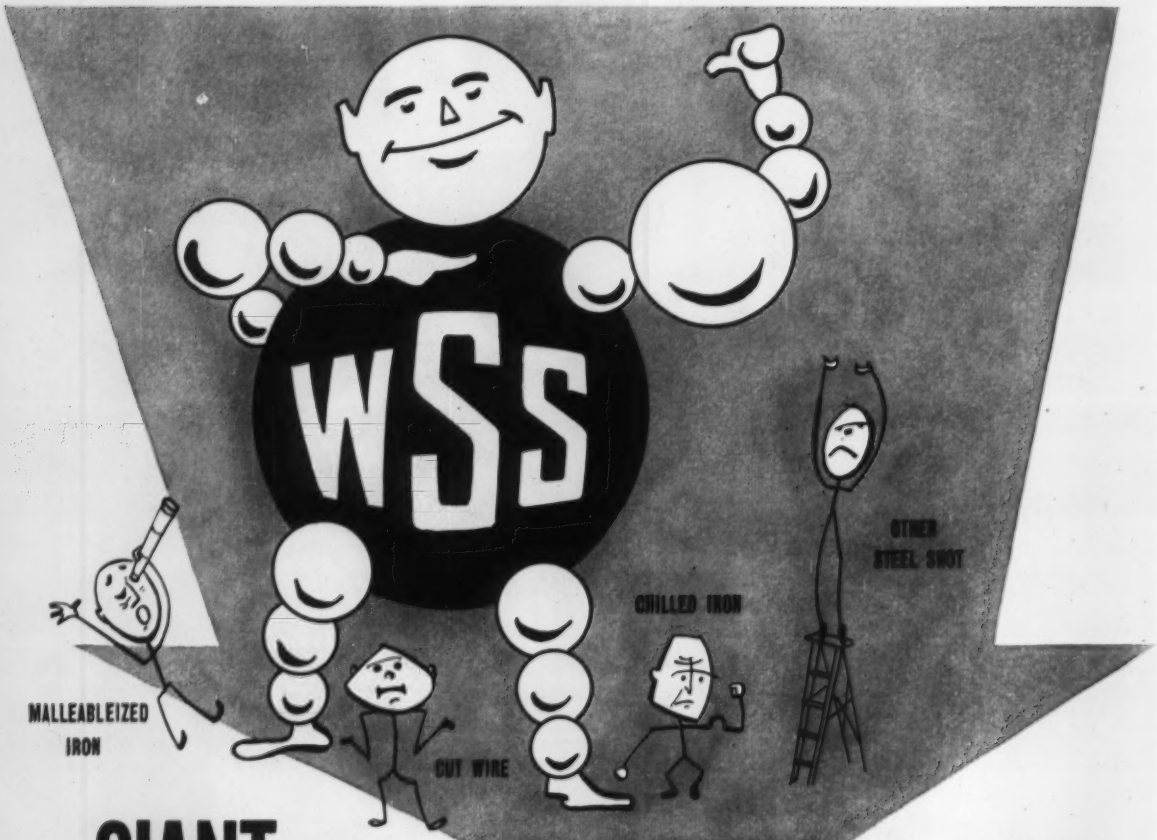
- CREATIVE ENGINEERING
- DESIGN EXPERIENCE
- OPERATING BACKGROUND
- AMERICAN MANUFACTURING SKILL

can offer you to modernize your seamless mill.

MANNESMANN-MEER

ENGINEERING AND CONSTRUCTION COMPANY, 900 LINE STREET, EASTON, PENNA

WORLD SPECIALISTS IN HIGH-SPEED TUBE MILL MACHINERY



For GIANT savings specify WHEELABRATOR® Steel Shot

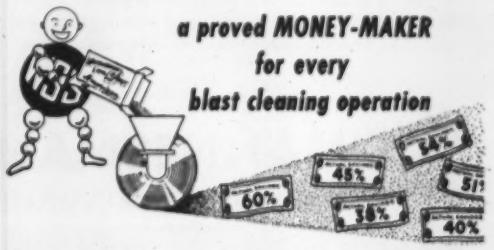
You may not see the difference by looking at abrasives, but you can't miss the GIANT savings you make when you use Wheelabrator Steel Shot in your blast cleaning machine.

Look at the chart in this ad. These 4 firms have saved 25% to 60% on shot costs by using Wheelabrator Steel Shot. In 2 years over 1,000 firms have changed to Wheelabrator Steel Shot . . . 400 from other steel abrasives. Let Wheelabrator Steel Shot make GIANT savings for you. Start using it today.

COMPANY	COST COMPARISON		SAVINGS IN ABRASIVE COSTS
	MALLEABLEIZED IRON	WHEELABRATOR STEEL SHOT	
An Ohio Steel Foundry	$1.35/ton cleaned	$.57/ton cleaned	60%
A Chicago Malleable Foundry	$1.10/ton cleaned	$.60/ton cleaned	45%
	STEEL SHOT AND CUT WIRE	WHEELABRATOR STEEL SHOT	
A Steel Processing Plant	5.06 lb./ton cleaned	2.80 lb./ton cleaned	45%
A Cleveland Gray Iron Foundry	$.465/ton cleaned	$.25/ton cleaned	46%

Write today for Bulletin 89-B

American WHEELABRATOR



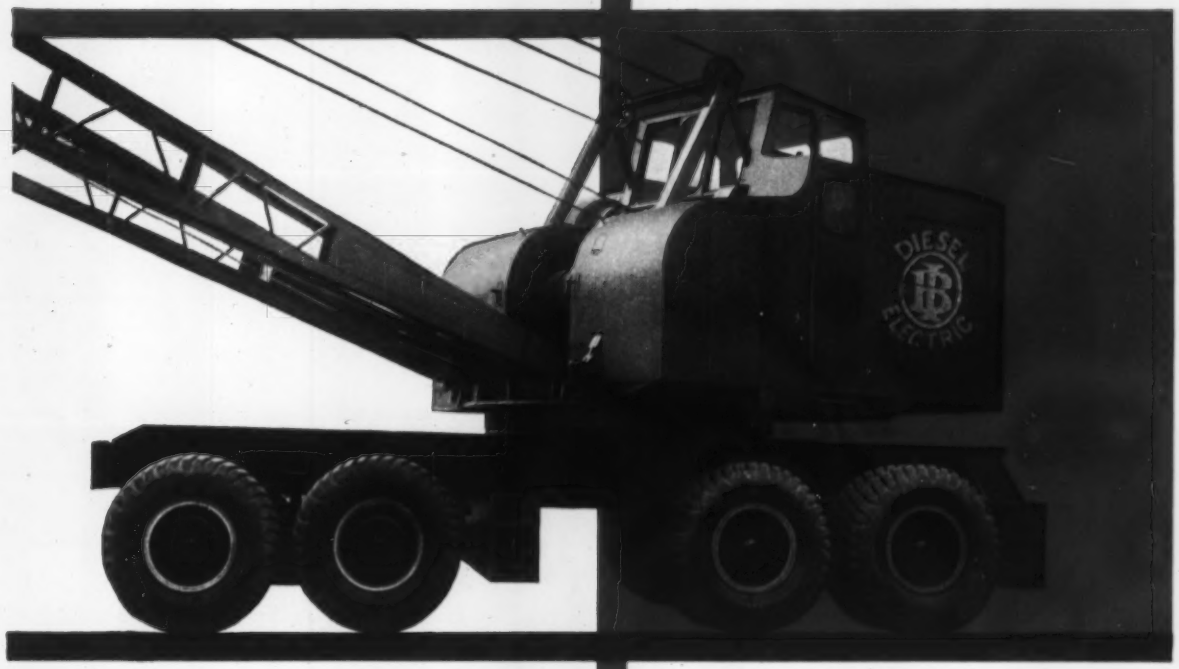
a proved MONEY-MAKER for every blast cleaning operation

AMERICAN WHEELABRATOR & EQUIPMENT CORP. **509 S. Byrkit St., Mishawaka, Indiana**

announcing

America's first and only rubber-tired diesel electric cranes

electric travel, electric rotation!
25 to 60 ton capacities!



Designed and built by Industrial Brownhoist Corporation for mines, quarries, railroads, steel mills, the lumber industry and other large manufacturing plants that require mobile materials handling equipment in heavy duty capacities, America's first Diesel Electric Wagon Crane is now in production. Available in capacities from 25 to 60 tons, the new wagon crane will be equipped with dynamatic clutch, anti-friction bearings at essential points, and power steering. It employs electric travel and electric rotation. Mounted on a 12-wheel crane carrier capable of speeds up to 8 miles per hour, the unit can be operated by one man from easy-to-reach crane and carrier controls. Rigorous tests indicate that the new machine provides economical operation and insures added savings of time and labor in heavy duty materials handling work. For complete details, consult a Brownhoist representative or write us today.

BROWNHOIST MATERIALS HANDLING EQUIPMENT GIVES A LIFT TO AMERICAN INDUSTRY

INDUSTRIAL BROWNHOIST CORPORATION
BAY CITY, MICHIGAN DISTRICT OFFICES: New York, Philadelphia, Pittsburgh, Cleveland, Chicago, Denver, San Francisco, Montreal • AGENCIES: Detroit, Birmingham, Houston

SUBSIDIARY OF Penn-Texas

179

BROWNHOIST

Fill all your

COLD ROLLED SPECIALTY STEEL

needs at Crucible

You'll find, at Crucible, dozens of *prescription-made* cold rolled steels designed for special applications . . . steels for automotive stampings, business machine parts, saw blades, cutting dies, skates, springs and cutlery – to name just a few.

You'll find them in the widest possible variety – including carbon spring, alloy and stainless steels – in fact, in *any* ferrous analysis that can be cold rolled. And you're *sure* of *quality* at Crucible – the nation's leading producer of *special purpose steels* – for Crucible maintains *complete* control of production from ore to finished steel.

So when you need prompt delivery of *any* kind of cold rolled specialty steel *call Crucible*. Experienced Crucible metallurgists can help, too, in selecting the *best* steels for your job. And write for your free copy of Crucible's new 32-page booklet on cold rolled specialty steels. It's packed with useful data. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 30, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

DOES *your* MACHINE LOAD SYSTEM STACK UP TO THESE STANDARDS?

(Mr. Jones controls his shop... Mr. Smith's shop controls him...
How about you? Take a quick look at this check list!)

- ☐ Is your machine loading system flexible?
- ☐ Can you give shipping dates that mean something?
- ☐ Do you know your machine capacity for new work—right now?
- ☐ Can you easily adjust your load to handle new high priority orders?
- ☐ Can you tell quickly what jobs constitute the load on each machine or work center?
- ☐ Are you providing for downtime in your schedule?
- ☐ Are you performing in accordance with your preplanned schedule?
- ☐ Are you gaining customers through ability to meet your schedules?
- ☐ Can you notify customers promptly of schedule changes?

if **YOU'RE NOT GETTING THESE RESULTS,** then you may be interested in changing to a system that stacks up to these standards. Such a system is Sched-U-Graph – a visual chart-board method of control. It's economical. It's accurate. It cuts time-consuming calculations to a minimum and eliminates guesswork entirely.

Find out more about Sched-U-Graph today! See for yourself how it can save time and build profits in your plant. Get illustrated folder KD738 — "An Effective Machine Loading System." Write Room 1750, 315 Fourth Avenue, New York 10.

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DIVISION OF SPERRY RAND CORPORATION

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MANAGER • RESEARCH DIRECTOR

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Talk to **all levels** of

DEVELOPMENT ENGINEER • FACTORY MANAGER • LABOR RELATIONS DIRECTOR

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ES

metalworking management...

Build the strength of STEEL

into your advertising program

The power to make decisions affecting you and the sale of your product is in the hands of an ever-growing number of men in the Management Group. To sell metalworking you must talk to management men *at all levels.*

That's one of the big advantages you get with STEEL . . . because STEEL talks the language of the Management Group. STEEL's modern business paper reporting is geared to the needs of the men it reaches. Its editorial approach is tuned directly to the *management interests* of administrative, production, engineering and purchasing men who read STEEL regularly.

These are the men participating in buying decisions for *over 96% of metalworking's entire volume.* No other metalworking magazine delivers so many influential readers each week—no other sells so effectively *all levels* of the Management Group!

NT • PARTNER

Edited for metalworking men at every management level . . .

A Penton Publication

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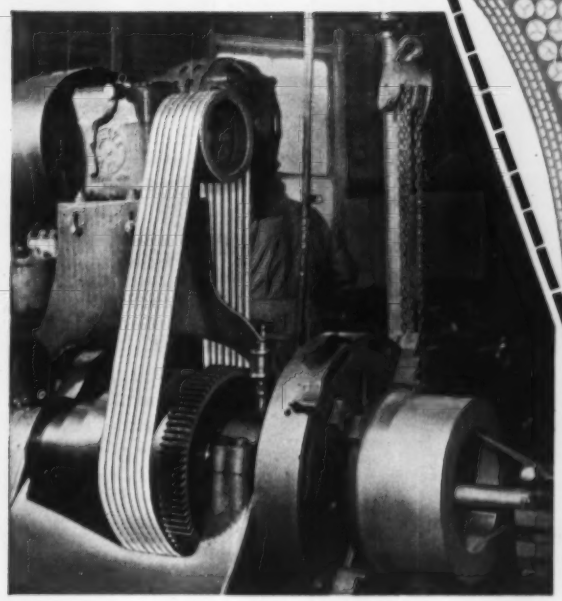
HAMILTON CANADA
"It's the best brand in the land..."
LET US TUNE UP
YOUR SPRINGS
SMALL
STAMPINGS
SPRING WASHERS
WIRE FORMS

"Secret" of *lower* belt costs is concave sides



By converting the drive on this lathe to Gates Vulco Ropes, drive slippage was ended. Under heavy load, the Gates Vulco Ropes grip pulley grooves more firmly and pull harder. Management states that now that the lathe can take heavier cuts, they are getting twice as much production as before.

Plants that keep track of costs on drives know this: they get longer wear at *lower cost per year of service* when they specify Gates Vulco Ropes—the V-Belts with *concave sides.*

Here's WHY concave sides keep belt costs down:

When the Gates belt is bent around the sheave, the *precisely engineered* concave sides (Fig. 1) fill out and become straight (Fig. 1-A). Thus the belt makes uniform contact with the sides of the pulley.

This full, uniform contact assures *even distribution of wear.* Naturally, *even wear* means *longer wear.* And longer wear cuts belt replacement costs...reduces down time...contributes to profits.

Prove to yourself the value of concave sides

Bend a straight-sided belt (Fig. 2) and feel the sides *bulge out* around the bend. You see immediately that the bulging sides prevent an even fit in the pulley groove (Fig. 2-A). Uneven contact causes faster wear...increases belt replacement costs.

Reduce costs and down time for belt replacements—specify Gates Vulco Rope Drives—the V-Belt with *concave sides* (U.S. Patent 1813698). The Gates Rubber Co., Denver, Colorado—*World's Largest Maker of V-Belts.*

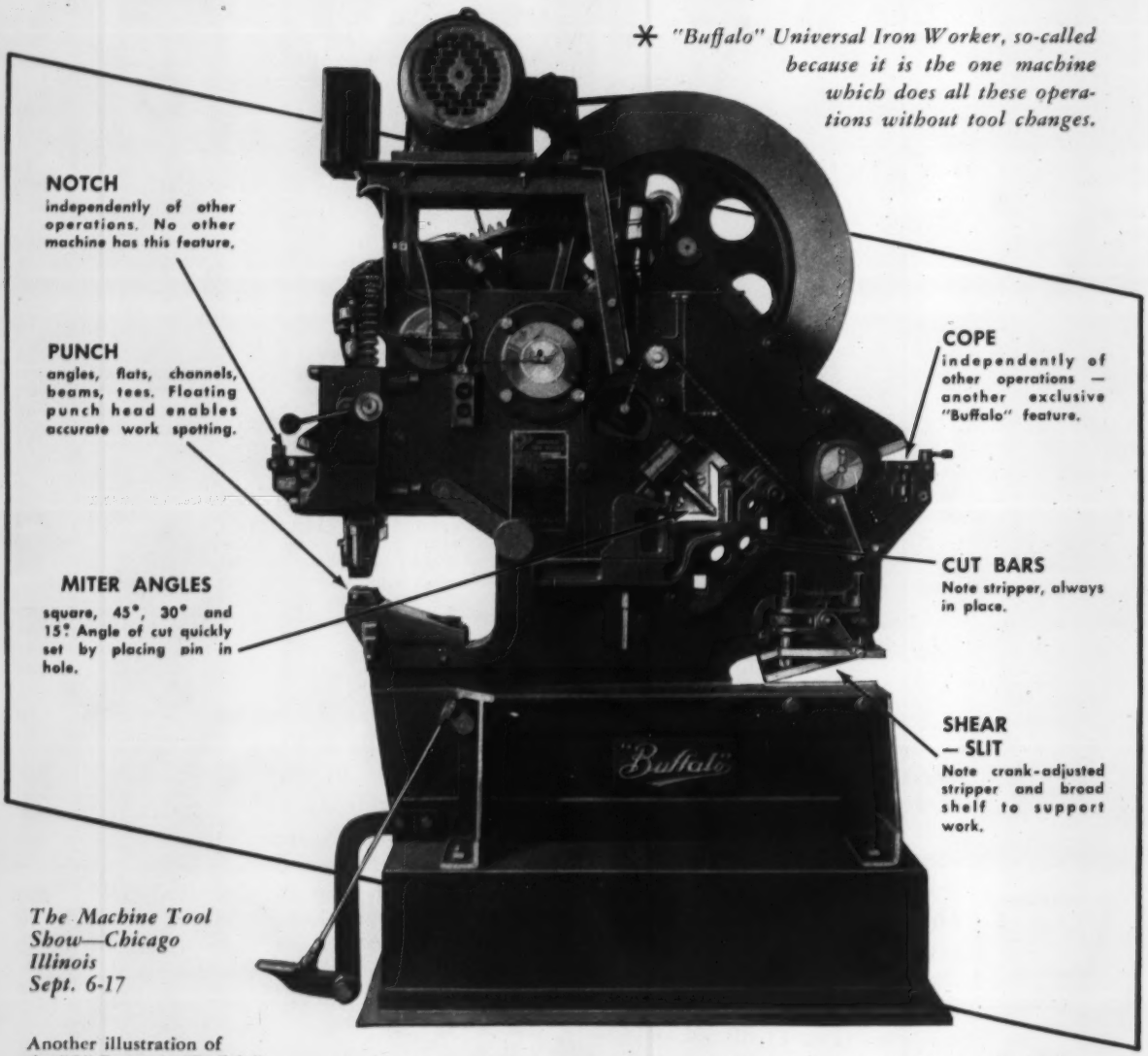
Gates Engineering Offices and Distributor Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

TFA 45-A

GATES VULCO ROPE DRIVES

YOU CAN DO MORE JOBS IN LESS TIME — WITH A U.I.W.*

* *"Buffalo" Universal Iron Worker, so-called because it is the one machine which does all these operations without tool changes.*


NOTCH
independently of other operations. No other machine has this feature.
PUNCH
angles, flats, channels, beams, tees. Floating punch head enables accurate work spotting.
MITER ANGLES
square, 45°, 30° and 15°. Angle of cut quickly set by placing pin in hole.
COPE
independently of other operations — another exclusive "Buffalo" feature.
CUT BARS
Note stripper, always in place.
SHEAR — SLIT
Note crank-adjusted stripper and broad shelf to support work.
"Buffalo"

The Machine Tool Show—Chicago Illinois Sept. 6-17

Another illustration of the "Q" Factor in "Buffalo" machines—*the built-in Quality which provides trouble-free satisfaction and long life.*

A Universal Iron Worker will save space — time — excessive conveying of work from machine to machine in your shop — because it does so many jobs. Often called the "most useful machine in the shop". For complete details, write for Bulletin 360.

ESTABLISHED 1877 "Buffalo" MEMBER N.M.T.B.A.

BUFFALO FORGE COMPANY

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DESIGNING WITH ALUMINUM

NO. 13

This is one of a series of information sheets which discuss the properties of aluminum and its alloys with relation to design. Extra or missing copies of the series will be supplied on request. Address: Advertising Department, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California.

COLOR MATCHING OF ANODIZED ALUMINUM ALLOYS

COLOR MATCHING, in the sense of "tone" or "shade," among the various aluminum alloys can be rather complicated. The degree of complication depends greatly upon the type of finish which is desired for the various alloys which might be used in making up an aluminum assembly.

Generally, the appearance of various wrought and cast alloys will vary slightly in the mill-produced condition because of different alloy constituents at the surface. The simplest way to achieve the most uniform color among the various alloys is to polish them mechanically. Practically all freshly polished aluminum alloys look alike. However, ordinary weathering or aging in industrial atmospheres will cause slight surface film reactions. The products of these reactions will differ for the various alloys. Generally, aluminum alloys retain a bright pleasing appearance despite extended exposure to the weather. A few alloys will darken upon weathering.

Alloys that contain silicon, such as 4043, and those that contain copper, such as 2024, are among the alloys which darken rapidly upon exposure in the unprotected condition. There is no way to prevent this except by anodizing, chemically coating or painting.

Chemical conversion coatings, while often providing satisfactory protection from the environment, are not usually suitable for decorative applications. If a good permanent color is important to a design, and if painting is not desirable, anodizing is necessary. In a situation such as this a very careful selection of alloys must be made before anodizing in order to obtain a good color match —or contrast if it is desired. All alloys will exhibit slight to marked color differences after being anodized. Some alloys are fairly close in anodized color, especially when the anodic coating is not too thick. Figure 1 shows both matching and contrasting anodized aluminum alloys.

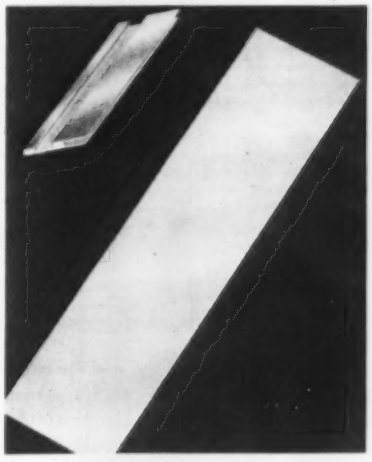

Fig. 1. Anodized 6063 extrusion alloy and 5005 sheet alloy lie side by side on a sheet of anodized 4043 sheet alloy which is quite dark. Notice that the 6063 and the 5005 match each other in color value but contrast sharply with the 4043.

A recognition of the technical principles which must be employed in the selection of the various alloys for color matching of their anodic coatings is of value in many applications of aluminum. In the architectural field alone the subject of color matching in anodized aluminum is assuming greater importance. Almost daily aluminum usage increases in such things as curtain wall construction. Table 1 lists many of the aluminum alloys in general use today and shows the approximate color matches obtainable through anodizing. For maximum color similarity slight variations in the anodizing process are necessary and should be established by the processor. The chemical compositions and tempers of the alloys are the basic reasons for differences in color after anodizing.

The commercially pure materials, such as 1100, EC, 1180 and the cladding material of Alclad alloy 2024, all exhibit relatively good color matches after anodizing. Those Alclad alloys which employ 7072 as the cladding, e.g. 3003, 3004, 5050, 6061 and 7015 will match well after anodizing. As a class, alloys containing magnesium provide relatively good matches, especially if the anodic coating is of moderate thickness. The magnesium content exerts a slight influence upon the color, but the purity of the alloy base is even more important. As a general rule, the higher the purity of the alloy base, the more transparent and the brighter the appearance of the anodic coating. Thus, anodized 5052 is brighter than anodized 5050.

Alloys containing copper, for instance 2014 and 2024, generally develop dark unattractive coatings when anodized in the annealed condition. The same alloys, when properly heat treated and quenched, may give relatively clear, attractive anodic coatings that will approximately match anodic coatings on alloys 1100 and 5005. A similar situation exists for 7075 alloy.

The high silicon alloys, such as No. 43 and No. 380 which are frequently employed in castings, present a very difficult problem since the silicon constituent darkens upon anodizing and, with sufficient anodic coating thickness, may be quite black. It is impossible to match such anodized casting alloys with most other aluminum alloys in the anodized condition. A match is possible with alloy 4043.

Aluminum casting alloys containing principally magnesium rather than silicon, on the other hand, match reasonably well with most other alloys. Casting quality and technique have an

PLEASE TURN TO NEXT PAGE

TABLE 1

APPROXIMATE COLOR MATCHES OF ANODIZED ALUMINUM ALLOYS

O = Relatively Good Matching X = Better Matching

	Sheet and Plate Alloys																Extrusion Alloys						Casting Alloys			
Sheet and Plate Alloys	1180	1100	2014*	2024*	Alclad 2024	3003	Alclad 3003	Alclad 3004	4043	5005	5050	Alclad 5050	5052**	6061	Alclad 6061	7075*	Alclad 7075	1100	3003	2024*	6061	6063	7075*	43	A214	A218	380
1180	X	O			O													O									
1100	O	X	O	O	X					O						O		X		O			O				
2014*		O	X	O						O								O		O					O	O	
2024*		O	O	X						O								O		X					O	O	
Alclad 2024	O	X			X													X									
3003						X													X								
Alclad 3003							X	X				X			X		X								O	O	
Alclad 3004							X	X				X			X		X								O	O	
4043									X															X			X
5005		O	O	O						X	O		O	X		O		O		O	X	X	O		O	O	
5050										O	X		O	O		O					O	O			O	O	
Alclad 5050							X	X				X			X		X								O	O	
5052**										O	O		X	O							O	O			O	O	
6061										X	O		O	X							X	O			O	O	
Alclad 6061							X	X				X			X		X								O	O	
7075*		O								O						X		O					X		O	O	
Alclad 7075							X	X				X			X		X								O	O	
Extrusion Alloys																											
1100	O	X	O	O	O					O						O		X		O			O				
3003						X													X								
2024*		O	O	X						O								O		X					O	O	
6061										X	O		O	X							X	O			O	O	
6063										X	O		O	O							O	X			O	O	
7075*		O								O						X		O					X		O	O	
Casting Alloys																											
43									X															X			X
A214			O	O			O	O		O	O	O	O	O	O	O	O			O	O	O	O		X	O	
A218			O	O			O	O		O	O	O	O	O	O	O	O			O	O	O	O		O	X	
380									X															X			X

* Heat treated and quenched ** For relatively thin anodic coatings, i.e., not exceeding 20 min anodizing

even greater influence on anodizing characteristics than does the alloy composition.

Among the sheet and plate alloys it is almost impossible to match alloys containing manganese, such as 3003, with other alloys as far as color in the anodized condition is concerned.

Some examples of compatible pairs for anodizing are 5005 and 6063, 5005 and 6061, 1100 and Alclad 2024. Numerous other examples may be chosen based on the principles outlined above. Of special interest to designers and engineers who are concerned with building materials and architectural design, is the excellent color match which may be obtained in the anodized condition with the sheet alloy 5005 and the extrusion alloy 6063. Alloy 5005 is a magnesium-containing alloy (nominal 0.8% Mg) with strength and formability approximately equal to those of 3003 alloy. Alloy 6063 is the extrusion alloy which is employed almost universally in window frame molding and store front trim. Where an architect wishes to use an anodized sheet product close to an anodized 6063 extrusion, a definite clash in color will result if alloy 3003 is employed as the sheet material. However, alloy 5005 when employed in place of alloy 3003, exhibits an excellent color match with 6063 when both alloys are anodized to the same coating thickness.

The understanding and application of the principles affecting the colors of anodized aluminum alloys will provide the means for attractive architectural design work. These same principles will undoubtedly influence the choice of aluminum alloys for products outside the field of architecture.

Further information concerning the color matching of anodized aluminum alloys may be obtained from the Kaiser Aluminum sales office listed in your telephone directory, or through one of our many distributors. Kaiser Aluminum and Chemical Sales, Inc. *Executive Office:* 6674 Kaiser Building, Oakland 12, California; *General Sales Office:* Palmolive Building, 919 North Michigan Ave., Chicago 11, Illinois.

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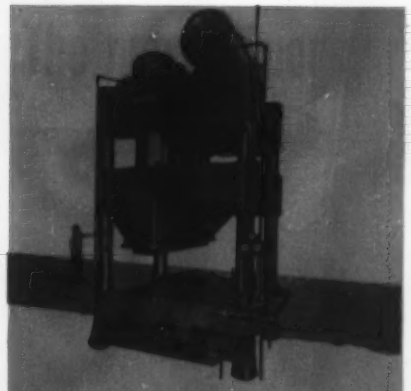

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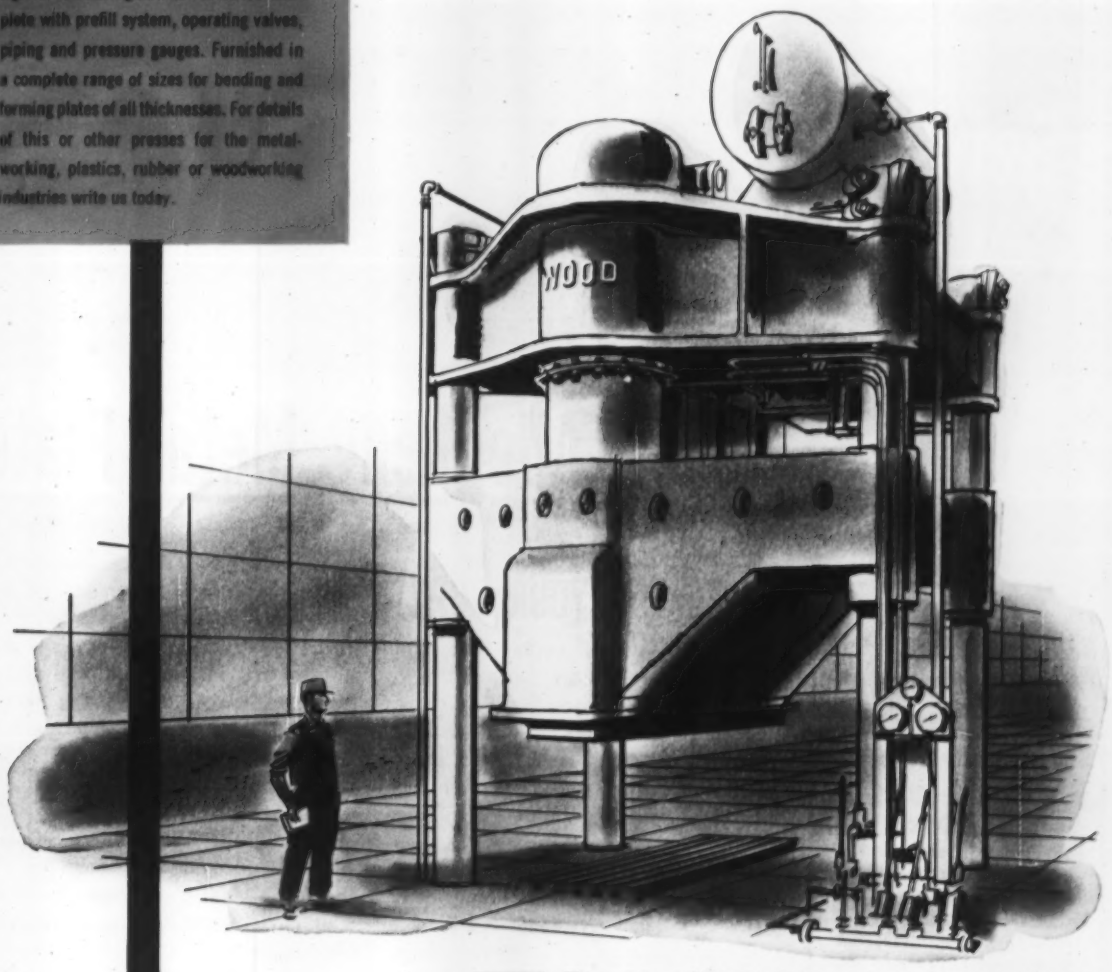

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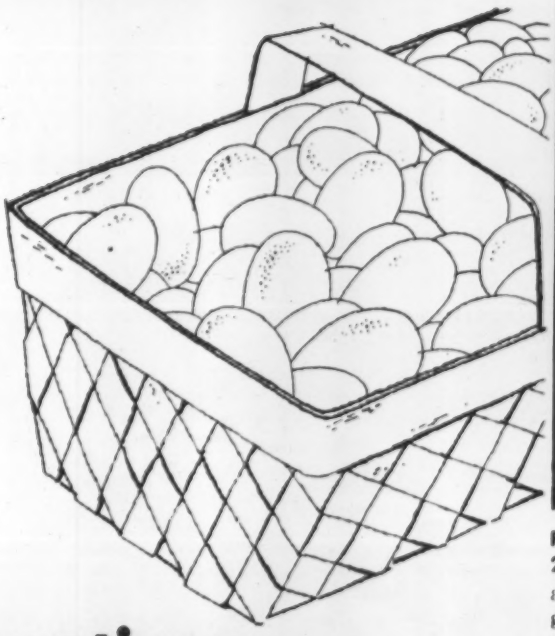

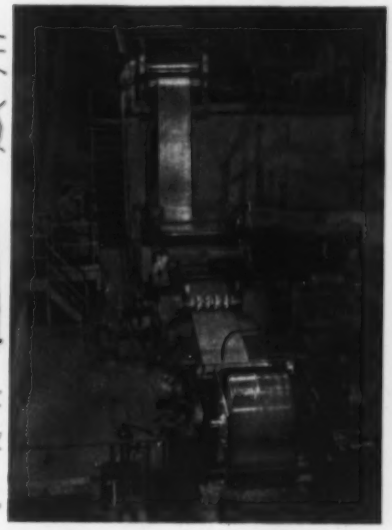

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Metalworking Outlook

Nickel Pickle Continues

The mystery about nickel remains unsolved. For five months, rated orders arriving at International Nickel Co. have exceeded stated defense requirements. Usually, the reverse is true, because the Pentagon has a habit of exaggerating its needs. There's no inventory-building of the metal by users. Apparently, the armed services are underestimating their requirements. As a result the Defense department wants Business & Defense Services Administration to order nickel consumers to submit order boards regularly to learn where the nickel is going and for what. Don't expect BDSA to institute such an order soon.

Price Spread Widens

The price spread between farm and factory products is now the widest since the end of World War II. Bureau of Labor Statistics figures show farm product prices now down 23 per cent from the 1951 high. Prices on products other than farm and food items are down less than 2 per cent from the 1951 level. Climbing factory wages up 17 per cent since 1951 form the big prop under prices of manufactured products. Huge output and waning exports have pulled farm prices down.

Dress Rehearsal?

Watch the joint strategy by a CIO and an AFL union in the current negotiations with Aluminum Co. of America. This could be the dress rehearsal for many such joint actions when the two groups are formally merged. The CIO United Steelworkers of America and the AFL Aluminum Workers will probably settle for the 15-cent wage package won in steel (page 146).

Coming in Coal

Look for the next big labor news this year to come in coal. John L. Lewis passed in 1953 and 1954, but he believes his hand is better now that coal production has improved. About 425 million tons will be mined this year, compared to 392 million in 1954, the postwar low. Mr. Lewis will ask for a 15-cent raise or a reduction in work hours with the same rate of pay, $18.25 a day. The object of the latter would be to spread the work. An estimated 170,000 miners lost their jobs from 1947 through 1954. And when will the coal wage demands come? The cagey Mr. Lewis isn't talking.

Bigger Splash in Shipbuilding

Prospects for shipbuilding look better, too—especially since Congress has approved $86,450,000 for new construction. The bill provides for U.S. financial help in building four combination passenger ships, five cargo vessels, ten trade-in-and-build tankers and a big prototype tanker. Only two or

three of the 20 ships provided for will get into the yards before the end of the year. But it's still a boost because only 22 vessels are now under construction.

Tax Write-offs in Trouble

The freight car shortage may be used by Congress as an excuse to kill or restrict fast tax write-offs. Rep. Robert Mollohan (Dem., W. Va.), heading a subcommittee on legal and monetary affairs investigating the use of amortization, claims the railroads have simply used the tax device to replace cars, not increase their ownership. Major purpose of amortization is to encourage expansion. Defense Mobilizer Arthur Flemming and Treasury Secretary George Humphrey have already indicated they favor some modification of tax write-off procedures.

Piston Engines Hang on

Is the piston aircraft engine doomed to extinction by turboprop and turbojet power plants? Not for at least ten years, says Burt C. Monesmith, vice president of Lockheed Aircraft Corp. Air travel is expected to jump from 36 million revenue passenger miles in 1955 to 72 million in 1965. "Because jet aircraft are years away from quantity production, it is certain that piston-engine planes will have to carry the bulk of the load, about 65 per cent, even in 1965," predicts Mr. Monesmith.

Dilemma of the WOC's

It has been hard enough to get good industry men to serve in Washington without compensation. It will be even tougher if the Senate Banking Committee's amendments to the Defense Production Act are passed. The Senate bill as it stood last week forbade "WOC's" from holding positions as chiefs of bureaus, divisions or sections of government agencies or from acting in any other policy-making capacity. Many WOC's are now serving in such capacities at the Business & Defense Services Administration and other agencies.

Straws in the Wind

Kelsey-Hayes Wheel Co. has agreed to a new labor contract similar to those signed last month by General Motors Corp. and Ford Motor Co. . . . San Francisco-area car dealers, repair shops and jobbers have signed a labor contract with AFL auto workers granting them a paid holiday on their birthdays . . . Majority of more than 1400 production employees of Copeland Refrigeration Corp., Sidney, O., have elected to postpone or cancel their vacation plans this year and remain on the job to help the company meet its customers' requirements . . . Defense Secretary Charles Wilson has signed directives intended to assure better positioning of stocks and balanced inventories and to assure maximum utilization of federal catalog data by the armed services; those two areas were pointed out by the Hoover Commission as needing attention.

Efficiency in Cutting-off is Important

Practically all machining operations start with pieces cut-off from bars or billets. Hence, inefficiency, or lack of capacity, in the cut-off department can hold up or stagnate the entire plant.

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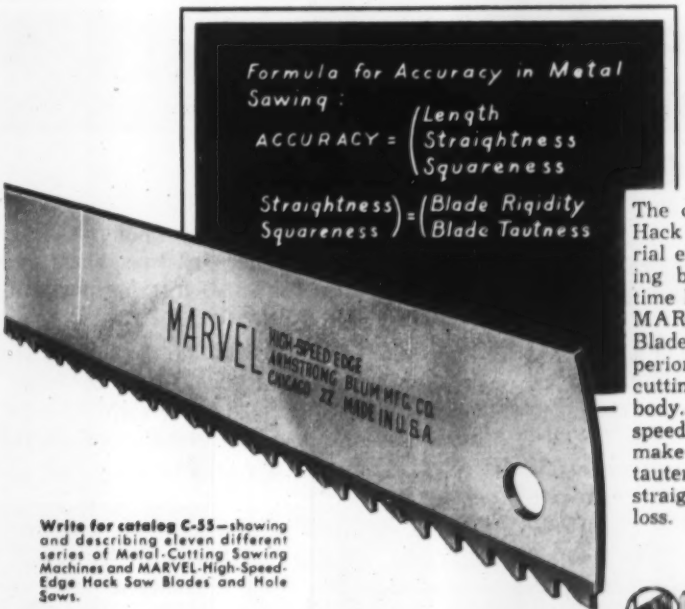
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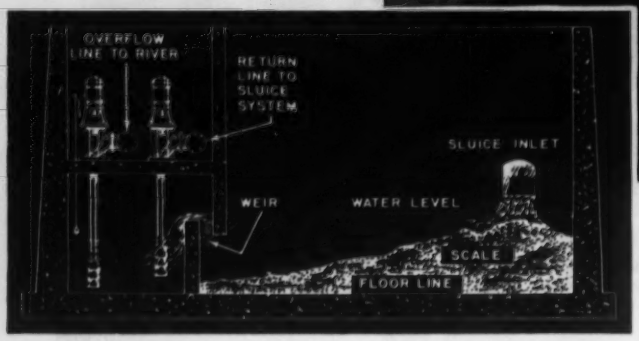
Pumping Pit with Ingersoll-Rand vertical turbine pumps, heart of mill-scale recovery system at Allenport, Pa. plant of Pittsburgh Steel Corp. Two 6000 gpm units, in foreground, recirculate settled water. Smaller 3000 gpm pumps, at top, discharge overflow into river.



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Trend Line to Success

We have been reading "Business Trends; Put Them To Work," on page 93. To it, we applied our standard editorial test: To whom will this article be of interest?

We know the president of one of our larger steel companies carries a billfold in which the plastic cardholders are filled with business trends affecting steel demand. Each week or so he submits his wallet to the company's economists who bring the statistics up to date. At all times he has pertinent business trends for instant reference.

Certainly top management watches and uses business trends. But what about the men lower down? Is the $18,000-a-year executive interested? The $12,000 man? The $6000 junior?

In 1953, the assistant purchasing agent for an Indiana appliance manufacturer was under instruction to buy all the sheet steel he could obtain within certain price limitations. Much of the material was being bought at premiums and stockpiled in the scarcity-born belief that steel in inventory was better than money in the bank. Our assistant buyer noted that inventories were climbing and that new orders were declining. He figured supply at long last had caught up with demand. He sent a memo to his boss suggesting the company slow down on steel purchases. Within a few months, steel was readily available at normal prices. Our assistant buyer soon became director of purchases. Coincidence?

Another friend was superintendent at a medium-size bearing plant at the end of World War II. Studying automobile production statistics, he was impressed by the then new trend toward automatic transmissions. Knowing the number of small bearings required for the automatic shifts, he recommended to management that the company increase its capacity to make them. Management did and was in a position to take advantage of the boom in small bearings. Our friend today is works manager of a much larger company. Watching the business trends paid off for him and his company.

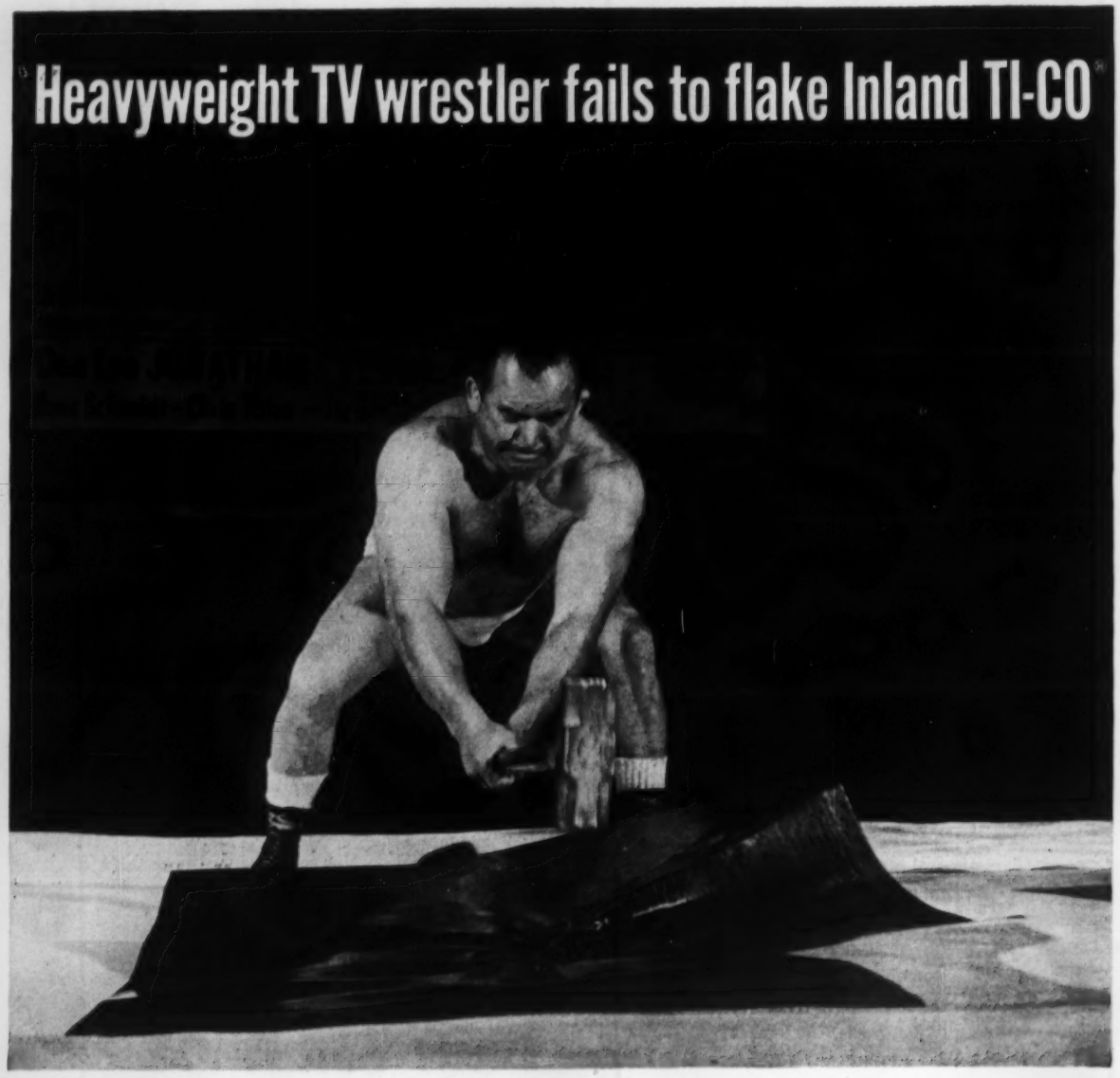
We believe sound business statistics are of interest to all levels of management. We believe top management appreciates receiving recommendations supported by facts rather than hunches.

We believe the individual's chances of promotion and the company's chances of success are enhanced by close attention to business statistics and trends.

Walter J. Campbell

MANAGING EDITOR

Heavyweight TV wrestler fails to flake Inland TI-CO



Well-known television wrestler, **Zack "Old Ironsides" Malkov,** *one of the roughest, strongest "grunt and groaners" in the business, puts his full 235 pounds behind a 10 lb. sledge hammer in an attempt to break the zinc coating on a sheet of Inland* TI-CO *Galvanized Steel.* TI-CO *rolled with the punch, the sheet gave but the coating stayed put!*

Not many applications require the coating on TI-CO to take the punishment of repeated blows by the business end of a sledge hammer! We think this unusual demonstration does illustrate, however, the ability of TI-CO to take even the toughest fabricating operations . . . stamping, drawing, crimping, double-seaming, brake forming or even spin drawing . . . without cracking or flaking of the zinc coating.

TI-CO's secret is in the patented Sendzimir process which produces a galvanized sheet with a tightly adhering zinc coating that flows with the base metal as it is being fabricated. This flexible, uniform coating means that products made with TI-CO are easier and cheaper to produce because re-dipping after forming is eliminated. And they stay serviceable and good-looking longer.

It will pay you to specify Inland TI-CO *for all your galvanized steel requirements.*

INLAND TI-CO . . . with the zinc coating that rolls with the punch.

Close-up of TI-CO *after sledge hammer test. Shows severity of strain on sheet and complete absence of cracking or flaking of the zinc coating.*

WANT MORE FACTS? *Write for our new* TI-CO *catalog. It's a word-and-picture story of* TI-CO *in action.*

INLAND TI-CO

INLAND STEEL COMPANY

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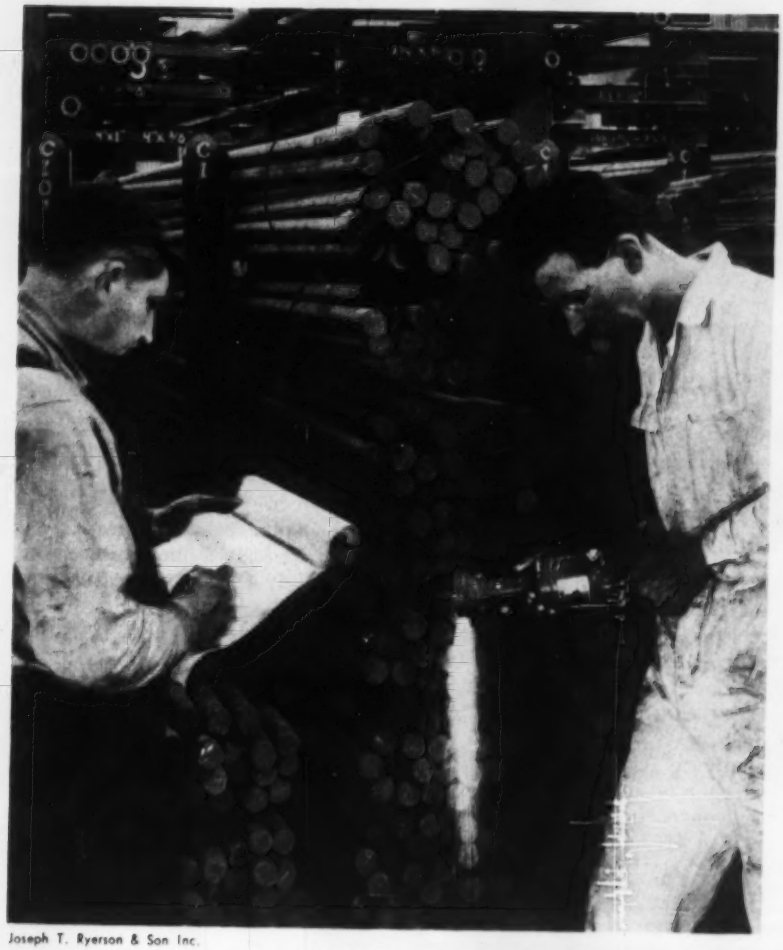


Joseph T. Ryerson & Son Inc.

"Spark testing is not enough," says military

Steel Birthmarking: Painful?

Defense department is proud father of a new marking system for military steel. But to many steel producers and fabricators, the new baby spells sleepless nights

"STEEL producers will honestly try to comply with the new requirements but they can hardly be described as happy about them."

That's how Harry Jacobsen, chairman of the American Iron & Steel Institute committee on shipping and marking, describes MIL 183, the new military standard for continuous marking of defense iron and steel products

Doubts—Although the industry committee has been working with the Defense department on the new standards since last fall, many producers feel they have been blackjacked into agreement. Cost is one of their primary concerns.

Says Earl Burke, shipping manager for Republic Steel Corp.: "Take a product like cold drawn bar. To mark it, we'd first have to lift it from the regular production sequence, clean it to remove the oil and then dry it. After marking, it would have to be re-oiled. The whole thing might well end up costing almost as much as the steel is worth."

Confidence — Surprisingly, the Defense department says it will be happy to absorb any increased cost. It has in the past required warehouses to mark the required data on many critical steels. It hopes that if the primary producer is doing the marking chances for error will be reduced and costs may be lowered, since there'll be a big incentive for producers to mechanize the operation to avoid uneconomic hand operations.

The department's position is that present methods of identifying stock, like spark testing and chemical analysis, are time-consuming, costly and inadequate. Some fabricators agree.

Cases—N. L. Mochel, manager of metallurgical engineering for Westinghouse Electric Corp., Philadelphia, is on record as saying that materials are becoming so increasingly complex that clear identification is essential. "An aspirin is clearly marked, why not steel," he asks. Ray Greenough, vice president of engineering, Cleveland Pneumatic Tool Co., says that he is having to handle so many new steels every day that identification is becoming an increasing problem. "Standard marking would help."

Other fabricators disagree. Remarks Glen Hackett, director of purchases for Thompson Products Co., Cleveland: "If the new standards are going to add to material cost, they're not justifiable, especially since they could be avoided by the use of routine care in warehousing practice."

What Is It?—Like it or not, MIL 183 is here to stay. Primarily concerned with high alloy compositions, it affects bars, extruded shapes, cut lengths of plate, sheet and strip and tubular products. It requires that the producer's name or trade mark and a "commercial designation" be printed, stamped or otherwise legibly marked in constantly recurring symbols at intervals not greater than 3 ft throughout the length of the product.

Alloy steel sheet and plate will have more than one row of markings, depending on its width. No tubular or extruded products un-

der ¼-in. outside diameter need be marked.

Explanation — "Commercial designation" markings are composed of AISI or other recognized specification numbers plus data on temper or other physical condition approved by the AISI or other authority. If such standards can't be applied, data giving the specification to which the material was produced, its type, grade and class are to be shown.

All steels falling within these classifications, however, don't have to be marked. The Defense department can rule on whether or not marking is to be used by either contractors or subcontractors in its material specification, contract, or order. It will restrict marking to "critical" applications and to material destined for inventory, points out Mr. Jacobsen, who, besides chairmanning the AISI co-ordinating committee, is packaging and loading director for U. S. Steel Corp.'s American Steel & Wire Division.

How Much?—You can bet that less than 10 per cent of total steel output will be affected under today's conditions. Though figures on total defense take of steel products are classified, AISI says that direct shipments to ordnance and other military customers in May this year were only 87,000 tons.

Why then all the hullabaloo? One reason is that steel producers haven't had time to find out just what the decree will mean to them. There is no best way to handle the marking problem; all that's known for sure is that it will almost always mean a secondary series of operations. Experiments are going on with direct stamping, offset printing and printed plastic tape as three possible methods of handling the physical marking problem. One steel company estimates the cost of machines to mark bar and strip at between $12,000 and $15,000 per unit.

Buts — Neither have producers any way to estimate costs. Most have no accurate idea of how much of their output will be affected; few will be able to develop any until the first orders are issued under the new specification in early August.

There's one further problem. Many see the regulations as a new attempt by government to tell industry how to run itself. To all, it means more red tape. One thing is for sure, the system set up in MIL 183 won't be extended very soon to commercial products. Aluminum, copper and brass will be coming up (in that order) for the same military treatment shortly.

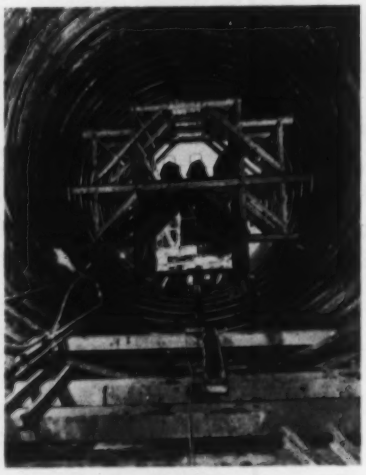
Auto Patch-up: $300 Million

Autobody refinishing is now a $300-million-a-year business, and metalworking gets a good share of it. Surveys show that for every $33 in auto paint sold by automotive jobbers, $67 goes for supplies and equipment like grills and trim, spray guns, exhaust fans, welders, abrasives and masking materials, says Permacel Tape Corp.

ODM Issues Write-Offs

During the period June 15-29, the Office of Defense Mobilization issued 30 certificates of necessity which authorized rapid tax amortization for $103 million of new or expanded industry facilities.

Largest write-off went to the Southern Pacific Pipe Lines Inc. which was allowed 25 and 40 per cent on portions of pipeline which totaled $293.1 million. Others receiving certificates included railroads.



Steel Rings Line Tunnel

The liner for the Lincoln Tunnel's third tube is made of 145 individual rings 5 ft wide and 32 ft 10 in. in diameter. For easy installation prior to welding, Baldwin-Lima-Hamilton Corp., Philadelphia, made all the rings in ten equal 1-ton segments

New Steel Firm?

Western Empire is going ahead with plans for a steel plant in San Francisco area

PLANS to go into the steel business at Oakley, Calif., under the name of Western Empire Steel Corp. are going forward.

President of the newly formed company is B. J. Klarman, 294 Fairmount Ave., Oakland, Calif. He currently is maintaining headquarters at the Waldorf-Astoria Hotel, New York, and the Mayflower Hotel, Washington.

Application — Western Empire Steel Corp. filed an application Apr. 26 with the Office of Defense Mobilization, Washington, for permission to make a fast writeoff of taxes. Total cost of the project was given as $131 million (see STEEL, p. 35, July 4). The application covers "steelworks and rolling mills."

The government has no steel industry expansion goal at the moment and therefore the ODM can't authorize a fast writeoff of taxes. There has been speculation the government might set up a goal.

From Scratch—Western Empire Steel has no plants, but it has an option on 2000 acres of land along the Santa Fe Railroad at Oakley, in Contra Costa county. That's the county in which U. S. Steel Corp.'s Columbia-Geneva Steel Division has its Pittsburg plant. Contra Costa county is in the San Francisco area.

Mr. Klarman says he already has the money for the project and that further details are being worked out and should be ready for announcement soon.

STEEL was told the Koppers Co. Inc., Pittsburgh, is figuring on the plant. Mr. Klarman says he is no way connected with the Yolo Steel & Metal Co. which was formed to contemplate a steel mill in Yolo, Calif., a couple of years ago.

Different Project—Another steel plant to be built from scratch is being considered by North American Steel Co. at Camanche, Iowa, near Clinton. Principal is C. A. Depue, president of Central Steel Tube Co. and Clinton Industries, Clinton. The project was first announced in 1951 and is being revived.

Ford Motor Co.

Labor Profile: 8-Cent Wage Boost, Fringes in 1955

"1955 will be an 8-cent year for the nation."

That's the judgment of Ben F. McClancy, secretary and general manager of Associated Industries of Cleveland, in a preview of what's coming on the labor scene.

Double Standard—For the northeastern Ohio area, where AIC's membership of 600 typical manufacturing companies is located, Mr. McClancy anticipates slightly lower wage increases, about 7 cents an hour. Reviewing 110 settlements made by members this year, AIC notes a weighted average hourly increase of 6.55 cents.

This average may be raised by settlements of the larger local employers stemming from auto negotiations in Detroit and steel negotiations in Pittsburgh. But, says Mr. McClancy: "This will only serve to reinforce our position that a double standard of settlements, one for the large company and a lower one for the smaller company, is becoming more general."

Typical — Today, the Cleveland manufacturing employee earns an average of $2.01 per hour, up 30 per cent from 1950. This figure represents all companies, large and small. If firms employing 1000 workers and over are excluded, the average straight time hourly rate drops to $1.90. In companies employing less than 50, the average rate is $1.77.

AIC's surveys show a further liberalization of fringe benefits. Ten of the 110 companies whose contracts are settled have given a seventh paid holiday. Nine added new benefits to their insurance programs and nine more improved existing benefits. Six granted time off with pay for death in the immediate family.

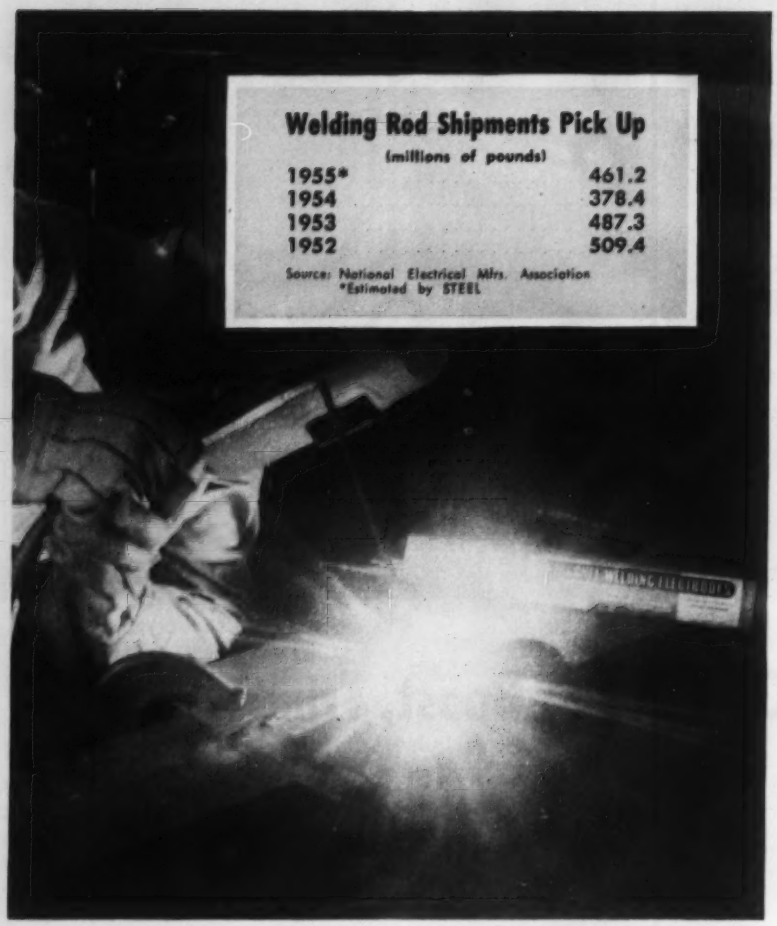
Thumbnail Sketch—Take a look at AIC's picture of the typical manufacturing employee:

Before he's hired, he's given a physical, results of which are available to him at one company of three. If assigned to the first shift, he starts work at 7 a.m. after punching a time clock. More than two-thirds of surveyed companies will penalize him if he's late. If there's no work for him, it's about an even chance he will get four hours' call-in pay. If he works a full shift, and should be called back later to work on a rush order, about 25 per cent of the companies will give him four hours' call-back pay even if he does nothing more than ring in.

Extras—It's an even chance that he will receive on-the-job training or attend a company training school. In either case he will be paid at his regular rate. At slightly fewer than 25 per cent of the companies, he can eat in a company cafeteria.

If he works overtime, he will receive time-and-a-half for all hours over 40 in one week and over eight in one day. He is paid weekly, usually on Friday and by check. He gets six paid holidays during the year. He has $2000 in group life insurance, either company-paid or on a share-the-cost basis. If he's sick or injured, he gets $30 a week from a sickness and accident insurance policy. He has hospitalization, and his surgical benefits are company-paid by one of three employers.

Holiday—He receives a five-day vacation with pay after one year's service, ten days after five years and 15 days after 15 years. About one-third of surveyed companies have employee recreation programs. If he takes part, he will bowl or golf. After 25 years' service he will be eligible for an old-timers club membership and will get a pin or watch. At 65, 25 per cent of the firms will pension him under a company paid program.



New life sparks the welding rod industry as . . .

Electrode Makers Bounce Back

AFTER slipping for three straight years since 1952 (see chart), welding rod shipments are headed up again. There's a good prospect that 461 million lb will be shipped this year.

National Electrical Manufacturers Association, New York, which acts as statistical spokesman for the industry, says that shipments through the end of May are up 22 per cent from the same period last year.

Makers Picture — While they agree that things are better, typical manufacturers contacted by STEEL vary in their estimates of the degree. Lincoln Electric Co., Cleveland, and National Cylinder Gas Co., Chicago, come up with a 10-per-cent gain from last year.

Page Steel & Wire Division of American Chain & Cable Co., now specializing in welding wire for automatic applications, is running 15 per cent ahead. Harnischfeger Corp., Milwaukee, registers 30 per cent and Ampco Metal, Inc., also of Milwaukee, reports shipments up a whopping 40 per cent.

Markets—"With steel output at a record high," says Ernest Dilberti, assistant manager of equipment sales for Air Reduction Sales Co., New York, "with production in steel fabricating industries constantly expanding, and with tremendous building and construction programs going on all over the country, demand for welding electrodes is higher than ever."

The most striking aspect of the situation is that sales are running as well as they are. As in 1954, defense demand for welding electrodes is low. The biggest single defense users of rod (combat tank makers) are idle. Other big users, like warship builders, ordnance automotive equipment makers, and builders of war aircraft frames are operating at reduced levels.

Impact—Though some rod makers, like Arcos Corp., Philadelphia, put defense business as high as 25 per cent of their total volume, the average of makers surveyed runs closer to 10 per cent, little changed from last year but far lower than in 1952. Then, dealers orders' backlogs rose as high as nine months of production because of defense demand frustrated by the steel strike, and welding rod makers had their best year since World War II.

The industry has recovered without this type of business because of the strength of its many customers throughout the economy. The upturn has come not merely from automotive and construction activity, but from such former sleepers as shipbuilding, railroads and machine tools. Alloy Rods Co., York, Pa., whose primary markets take in the oil, chemical and food industries, feels that the future's good because its customers are in growth industries. "We think that 1955 will be our best year to date," says one executive.

Technological Spurs—All makers report that iron powder electrodes, of both mild steel and the newer low hydrogen types, are helping boost their business because of the cost-savings that they can offer to fabricators. These rods—"the poor man's automatic welder"—enable even inexperienced operators to lay down smooth welds up to 30 per cent faster. The inert-gas consumable-electrode process and automatic submerged arc welding also merit mention here.

Prospects—Makers concur that 1956 should equal or slightly better this year's performance—with a couple of hedges. Remarks Westinghouse Electric Corp.: "It will depend on whether the government is going to continue new construction developments. Also, whether private industry will continue its expansion programs."

Preplanned Trade Shows Pay Off

By following basic rules, a company can insure greater returns for each industrial exhibition it enters. Money is not nearly as important as approach

IT'S SHOW-PLANNING time for executives in the overwhelming majority of metalworking's 60,000 plants.

Besides producing widgets, many a management man is now busy—or should be—producing an exhibit for one or more of the 2000 trade shows that will be held in the 1955-56 season.

Rehearsal—Now is the time to write the script, lay out the set and pick the actors for a drama that could be as important to your company as a Broadway hit to its backers. And like a Broadway show, you can't get it ready in two weeks. Start planning for selected exhibits at least four months ahead of time.

An adequate budget for your show is a crucial point, too. You can spend as high as $50,000, as little as $2000. But whatever you are willing to spend, remember that buyers will be coming voluntarily to see your exhibit. You're willing to spend money on sales calls at $17.24 each (national average computed by Sales Executives' Club of New York). At that rate, 116 visitors at your booth would justify a $2000 expense.

Backgrounds—Show backgrounds should subordinate visual appeal to personal and emotional appeal. Pointers to use: 1. Keep backgrounds uncluttered. 2. Display company name and trademark prominently. 3. Keep backgrounds well illumined so that those walking in the aisle will know what products are being featured even though they may not enter the booth. 4. If modular design is employed, backgrounds can be used in other shows. "We must have interchangeable parts as we feature different processes or different equipment in the shows we participate in," reports Air Reduction Sales Co.

Prior to the show, make use of tickets, announcement type ads, sales promotion letters, etc., to "lure" more people into your booth when the show opens. An extra 200 people brought into a booth by these devices means 200 potential friends and perhaps several "hot prospects."

Simplicity — Physical layout should be simple. Lighting can be one of the most effective working tools for an attractive display. Glare must be avoided but an effective use of inexpensive light can make a major contribution to attractiveness.

Rent furniture. It costs less in the long run. Then avoid the tendency to put too much furniture in a booth. Saul Poliak, Clapp & Poliak Inc., reports: "I rather admire those very few but hardy souls who have no furniture in their booths, on the theory that you can do more business faster on your feet."

More Preplanning—Demonstrations take careful thought. Big point: All demonstrations should be continuous. This enables the person who is "wandering by" to see the middle or end of a demonstration and then catch the beginning. Having set times, or long lapses between showings fails to intrigue people to come back at such-and-such a time. Don't forget that unless mass audiences can view, demonstrations will fall flat and will be the source of much grumbling.

Movies and closed circuit television should be approached from the same standards. In addition, canned talks should be avoided. This is another part of preplanning. Select narrators who have been screened so that a dull monotone voice does not send the visitor into a competitive booth.

Above all, staff your industrial show booth with qualified personnel (see check list). When you couple a preplanned booth with effective sales literature and qualified company personnel who can explain, clarify and sell—interest and inquiries will run high.

Staffing an Industrial Show Booth

1. Be sure that booth representatives are men with full technical knowledge.

2. Make sure each member of the staff knows how to work every product on display.

3. Never staff a booth with apprentice salesmen or new trainees.

4. Develop a schedule for booth personnel and stick to it.

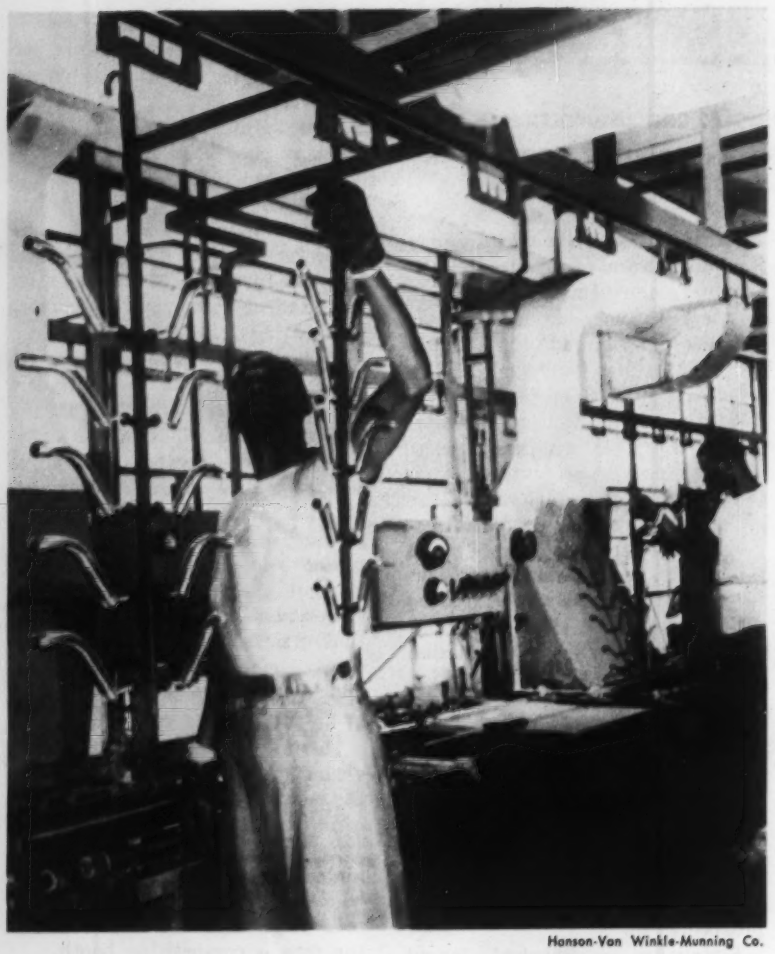
5. Have a dress rehearsal of all booth men before the show opens. This should include a question and answer period.

6. Insist that booth personnel make out a report on each person they talk to, filling out a form prepared for this purpose.

Source: Clapp & Poliak

Hollister Heads ICA

John B. Hollister, Cincinnati lawyer, is the new director of the International Co-operation Administration which will function under the secretary of state. This agency was established to replace the Foreign Operations Administration. ICA will continue the functions and responsibilities of its predecessor, but will turn over certain military supply matters to the Department of Defense. ICA's basic mission is to guide U. S. mutual security programs. Harold Stassen, former director of FOA, has been appointed as a presidential assistant on disarmament.



Hanson-Van Winkle-Munning Co.

Materials handling, versatile apparatus are keys to . . .

Brighter Plating Equipment Outlook

ALTHOUGH heading toward record sales in 1955, the plating equipment makers figure things would be even brighter if nickel ever broke loose.

The reason: Many plating jobs —and, consequently, equipment orders—are lost because of the nickel shortage.

How It's Done—But a record year is not a bad state of affairs. The plating equipment designers can take credit for much of the success through cost-cutting improvements. The two big areas of change are better materials handling and increased versatility of the equipment.

Time was when a plating setup was about as permanent as a plant foundation and constituted a department to which everything had to come. Now, smaller machines are being developed which can be skidded into position in any production line setup. Water and drain connections are made, along with the hookup of current, and the plating tank is in business. In machines made by the largest builder, Udylite Corp., Detroit, plant coveyors may be used in conjunction with bronze carriers to process the work on the same handling equipment that carries the parts to other operations on the line.

Coins Other Side—Converse to these small and very flexible machines are the other half of a trending dichotomy, very large installations. These machines of the type used for plating bumpers, grilles and similar parts in the auto plants have capacities running into acres of surface per day and can handle parts of many types simultaneously.

It's been axiomatic that each year the new cars have a greater plated area, and the trend shows no sign of abating. That's agreeable to the equipment makers who count the auto firms their number one customer. But growing in importance are such fields as hardware, tools, business machines, etc. At present, one source figures the business machine people rate number two behind the automakers in plating equipment demand.

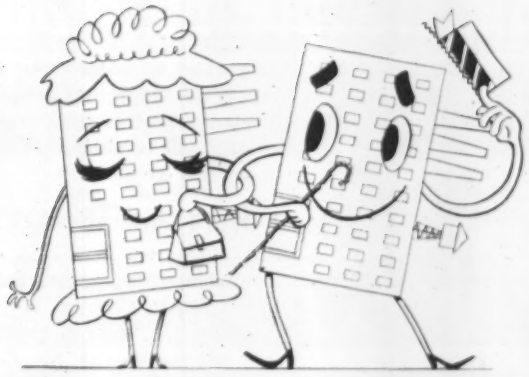
Squeeze—The trends in equipment are running to the very large machines on the one hand and the smaller machines on the other, with medium-sized equipment being squeezed out. Regardless of size, however, a trend for all equipment is to automatic loading and unloading of racks. The big reason is reduction in labor, handling and consequently cost.

With more automatic equipment in the picture and with much of it designed to fit right into the production line, it might be expected that the job platers would be losing out. Thus far that hasn't been true, with most shops having more plating work than they can do on their own premises. Job shops, too, are not getting behind in the trend to modern handling methods, and the built-in versatility of the equipment now being produced helps keep them competitive with the prime producer.

Thus more versatile and more efficient equipment makes the future of the plating machine builders as bright as the work their products produce.

U. S. Steel: Stainless Expands

Stainless steel sheet and strip capacity is going to be increased at U. S. Steel Corp. This expansion will include new facilities at the Vandergrift, Pa., and Gary, Ind., plants. The expansion program at Vandergrift will get underway immediately and will be completed in about 20 months. The Gary plant will receive new equipment and a general face-lifting.



Capital squeeze and rapid growth mean . . .

Urge To Merge Will Continue

THE SQUEEZE on working capital plus rapid growth are primarily behind the merger trend. This is indicated by a survey of 19 Michigan machinery manufacturers made by Prudential Acceptance Co., Detroit, a division of James Talcott Inc.

The 19 companies, all medium-sized makers of nonelectrical machinery, had a volume of about $30 million in 1954. Yet these companies find themselves in the middle—they are too small to turn to public financing, too big to get enough working capital through term loans from banks.

Why They Need the Money—Growth industries usually need more permanent and temporary capital. This is even more true for machinery companies — they must invest $15,000 to $20,000 in plant equipment and facilities for every worker; three or four times that amount is needed for highly mechanized plants. The national average for industry is $12,000.

Liquid working capital is needed to expand production and build inventories, now at rock-bottom.

What To Do—About half of the 19 manufacturers have investigated small stock or bond issues. The cost is almost prohibitive—up to 25 per cent of the total issue.

Many medium-sized machinery manufacturers are unable to obtain sufficient short term credit. And banks cannot tie up demand deposits in equity capital investments.

The Results—Tight working capital has resulted in a large number of mergers among nonelectrical machinery producers between 1948 and 1954, say the Michigan manufacturers. Mergers in this field totalled 166, the top figure in the list compiled by the Federal Trade Commission in its recent study on mergers.

The urge to merge has two facets: The smaller company accepts the idea because it relieves the squeeze on working capital. The larger company buys the smaller company to add the manufacturing facilities and know-how of the smaller firm.

The smaller and medium-size companies have flexibility, marketing ability and the desire to grow. They can tailor a machine for a user. The danger, they say, is that these qualities will be lost in the merger trend.

NAM Calls for Steadier Work

More than 100 result-getting ideas and practical techniques for stabilizing employment are listed in a new study of the National Association of Manufacturers, "Toward Steadier Work and Pay."

Henry G. Riter III, president of NAM, says there is a growing conviction that industry can do a still better job in providing regular work, adds "now is the time to prove it."

The NAM president says real job security comes from steadily rising production and warns of the danger of confusing job stability with economic stability.

In addition to giving advice in setting up job stabilization programs, the NAM booklet gives information on the savings possible through employment regularization. It explains how steady jobs cut employment compensation costs, overhead costs and maintenance costs while increasing efficiency, productivity and morale.

Power Truck Safety Outlined

"It doesn't matter if you use one or one thousand industrial trucks; driver training is a must," says W. A. Meddick, vice president, Elwell-Parker Electric Co.

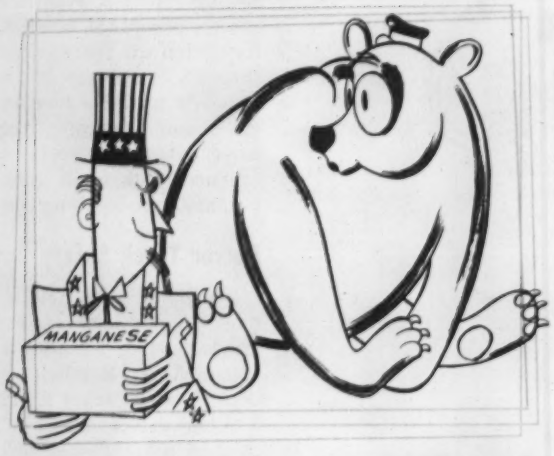
After driver training is accomplished, several rules should be followed: 1. Drivers should learn truck capacity and not attempt to lift more. 2. Do not allow loads to obstruct view. 3. Loads should never be picked up with forks off-center. 4. Vehicles should not skid wheels when stopping or starting. 5. Never lift personnel on truck forks. 6. Loads should be carried as low as possible. 7. Doorways, corners and other travelways should be outlined with bright colors or hash marks. 8. Trucks should stop and sound horn before entering doors of all buildings, when approaching blind corners, or turning into main aisles. 9. Operator's hands should be dry at all times. 10. If more than one truck is operating in a small area, they should stay at least 15-ft apart.

Prospect: Japanese Ore Fleet

Three Japanese iron and steel companies appear close to starting a long-considered plan to build a fleet of ocean-going ore carriers.

Yawata Iron & Steel Mfg. Co., Fuji Iron & Steel Mfg. Co. and Nippon Steel Tube Co. are talking over these reasons: 1. Carriers built last year have yielded excellent results in transporting ore. 2. Ships will be needed now that stable sources or iron ore are becoming available from mines developed jointly by Japanese and foreign interests in the Philippines, Malaya and India.

Present conditions of port facilities at loading and unloading points make advisable construction of 10,000 to 15,000-ton vessels.



Manganese Quotas May Expand

DOMESTIC MANGANESE operators may be on their way to winning the fight for more U. S. produced manganese.

As it stands now, while some 2 million tons of manganese ore are consumed each year, only 200,000 tons (10 per cent) are supplied by American mines, says J. Carson Adkerson, president, American Manganese Producers association. Russia, in previous years, has been the chief U. S. source. Russia no longer ships manganese to the U.S. and India, Cuba and the Union of South Africa are now the leading manganese exporters to America.

Action—The House committee on Interior and Insular Affairs and the House Rules committee have approved H.R. 6373 which would amend the Domestic Minerals Program Extension Act of 1953 in order to extend certain mining activities and encourage the discovery, development and production of various domestic minerals.

Crux — Under the proposed changes, manganese shipments to the government would continue until June 30, 1958, as long as shipments did not reach more than two times the original amounts specified in the 1953 Act.

Arthur S. Flemming, director, Office of Defense Mobilization, stated in a letter to the Interior committee that there was no justification for extending the quotas or the program. However, look for Congress to pass the change as feeling is running high that the government purchasing program should be extended until the newly formed Office of Minerals Mobilization, Department of Interior, has time to study the required mobilization base for minerals and metals.

Cataloging Progresses

Cataloging 3.7 million items carried by the four services is the mission of the Cataloging, Standardization, Inspection & Quality Control division which operates under the assistant secretary of defense. Roger Gay, on leave as chairman of the Bristol Brass Corp., heads the supervising group. With definite "production quotas" established, the division estimates that the job will be completed by September, 1956. During the cataloging, 1 million items will be eliminated. This simplified system will also be used by civil government services in the future and is being recommended for adoption by the North Atlantic Treaty Organization forces. As cataloging progresses, emphasis will shift to the standardization of military items. An effort is also going to be made to reduce the number of government tests a piece of equipment must be put through. This will call for close analysis of the process control equipment now being used by manufacturers—goal will be to reduce the number of federal inspection teams. A complete report of the division's activities will be submitted to Congress on July 31.

Here and There

• Charles A. Coolidge has been appointed a special assistant by Secretary Charles E. Wilson to study the Hoover commission reports pertaining to the Department of Defense. Look for DOD to adopt many of the Hoover commission recommendations.

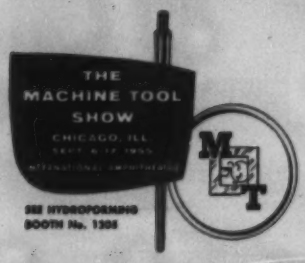
• Air pollution research is underway. The Senate approved House amendments and then forwarded the bill (S. 928) to the White House for signature which will allow an expenditure of $25 million during the next five years.

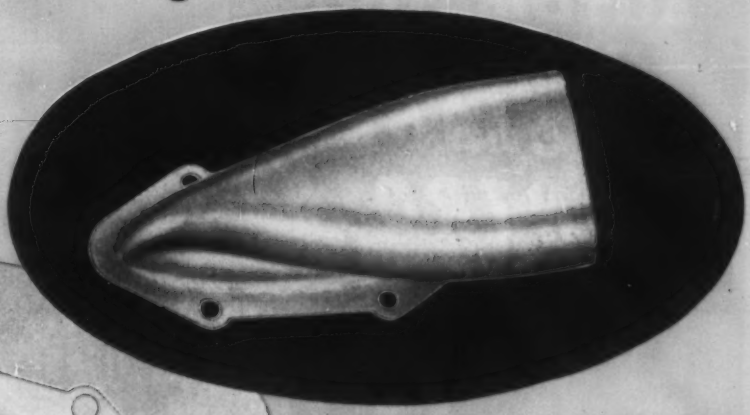
• Operation Alert was just a pilot exercise. "Another test of even greater magnitude will be made in 1956," says the Office of Defense Mobilization. ODM feels that paper plans are not enough and that all written plans for an emergency will have to undergo realistic tests.

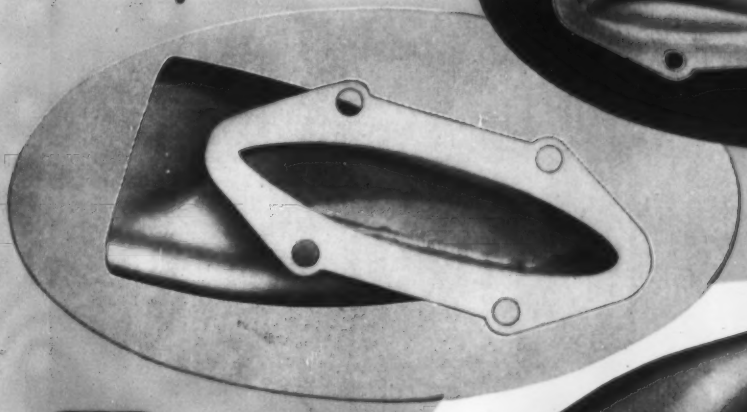
Meet William A. Simon Jr.: He is the newly appointed director of the General Components division of Business & Defense Services Administration and may be reached in Washington by calling Sterling 3-9200, Ext. 3155.

Mr. Simon is on leave from Walworth Co. where he serves as counsel. During World War II, he served as a commissioned officer on the aircraft carrier *Franklin*.

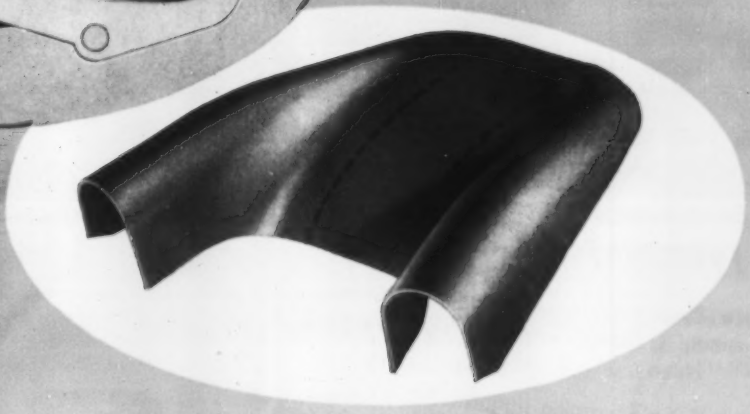
the answer to this tough one . . .

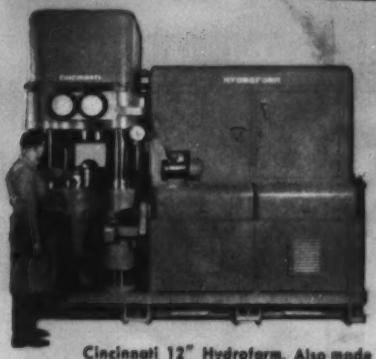






Two views of a jet engine component produced from the Hydroformed blank shown in the photo below. Material is 0.048" Chromaloy. Part length is 5¾".





Cincinnati 12" Hydroform. Also made in 8", 19", 23", 26", and 32" sizes.

was Hydroforming

The manufacturer who contracted to supply this jet engine component certainly got the job off to a good start. It was well planned throughout. The finished shape was to be obtained by drawing a blank of 0.048" Chromaloy to the required contours so that by cutting the part lengthwise, a right-hand and left-hand section would be produced. The sections, plus a stamped flange, were to be assembled by welding.

The shape of the punch was accurately developed and draw press tools were made. Then the trouble started. The available equipment would not form a satisfactory part. And time was getting short.

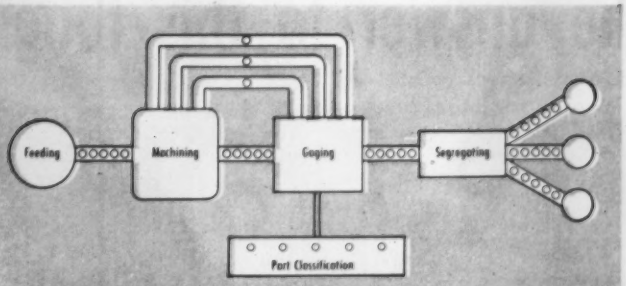
So the manufacturer shipped the punch and material to the nearest Cincinnati 12" Hydroform. The blanks were quickly drawn to shape—and the jet engine builder received the required number of parts on time.

Manufacturers who have invested in Hydroforming have been rapidly repaid in shortened part development time, in greatly reduced tool expense, in the elimination of operations, in part quality improvement. Let a Cincinnati Milling field engineer give you complete details. For a description of the Hydroforming process and specifications of the six machine sizes, write for Bulletin M-1759-3.

CINCINNATI **Hydroform**

PROCESS MACHINERY DIVISION
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U. S. A.

AUTOMATION DEMANDS RELIABLE CONTROLS



Dimensional control is the very heart of automation for the metalworking industry. Consequently, care in the selection of In-Process and Post-Process control devices is very important.

As a long recognized leader in air, electric and electronic gaging, Sheffield is prepared to furnish either:

- Packaged controls and tooling ready to install
- Complete automation gaging and transfer systems ready to operate

FUNCTIONS and ADVANTAGES

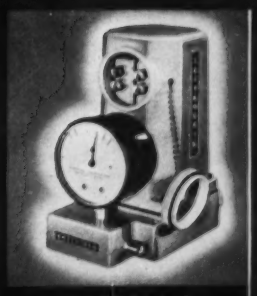
- Determine minute dimensional variations, rapidly and with repetitive precision
- Initiate warning signals
- Actuate control mechanisms
- Segregate acceptable, oversize and undersize parts
- Accurately classify parts by sizes
- Accommodate almost limitless range of tolerances
- Operate with interchangeable tooling
- Are small, compact and easily mounted
- Have unusually long, trouble-free service life
- Are easily interchanged

7125

Shown here are a few of those Sheffield control units so widely used in automated systems.

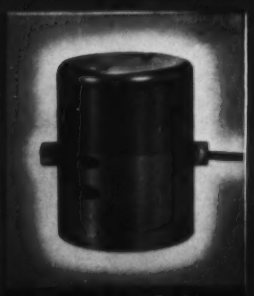
AIRLECTRIC

A limit type pneumatic control to actuate signals and relays.



LECTROLAIR

A sealed-in control to actuate signals and relays and also to give visual size indication.



DIFFERENTIAL

A gage head for checking taper, hole parallelism or hole center distance and converting the result into an actuating electrical impulse.

VARIATION

A pneumatic gage head for external or internal dimensions and face to axis runout—converts the result into an actuating electrical impulse.

For more detailed information, write for Bulletin AU-1154

The Sheffield Corporation
Division 500
Dayton 1, Ohio, U.S.A.

MASTER CRAFTSMAN SHEFFIELD HEADQUARTERS

SHEFFIELD

American Airlines

Air freight ton-mileage will jump 150 per cent by 1960 as . . .

Metal Products Take to the Air

AIR FREIGHT helped put aluminum jalousie manufacturers on the map.

Producers of the window shutters in Miami, Fla., were pretty much confined to their local trading area until such carriers as Riddle Airlines sold them on air-freighting their product to more distant markets.

Airborne—U.S. metalworking industry is shipping increasingly by air. American Airlines reports that it carried 34 per cent more automotive parts and accessories in 1954 than in 1953; the 1954 increase over 1952 totaled 163 per cent. Last year that classification led all others in weight carried by American, accounting for 12.8 per cent of the total 55,956,184 ton-miles hauled by the airline. But other metalworking products are flown in substantial volume, too. American flew machines and parts 4.2 million ton-miles in 1954—7.5 per cent of its total ton-mileage.

United Air Lines says that four of its top ten revenue-producing freight classifications are metalworking items—machines and parts, electrical equipment and parts, auto parts and aircraft parts. Over the past few years, its shipments of hardware have climbed 50 per cent.

Coming Up — Carriers such as Trans World Airlines expect a continuing increase in all metalworking products. American anticipates the most dramatic gains in electronics and nucleonics.

Speed is the big selling point for air freight. A shipment given to an airline in New York by midnight tonight will be delivered to the customer's door in Chicago tomorrow morning. Generally, airlines provide overnight delivery up to 1500 miles and delivery on the second morning for greater distances. The average air freight shipments weigh 200-250 lb and travel 800-900 miles.

Cost—Airlines sell their freight service on the basis of cost, too. Generally, rates above the 100-lb level are comparable to railway express charges. Because packaging for air freight usually is lighter than for other forms of transport, the airlines point to that as a saving, also.

In cost, air freight doesn't compare with water, truck or rail freight. But experts such as Emery F. Johnson, vice president and general manager of Air Cargo Inc., believe that costs can come down when an air freighter is built for freight only. Most in use today are modified passenger ships.

Drayage Service — Air Cargo is owned by 28 freight-carrying airlines to contract for the pick-up and delivery of air cargo at local airports. It has 328 contracts with truckers in the U.S. and will do a $2.5 million business in 1955.

Air freight revenue (exclusive of airmail and airexpress) hit $48.3

million in 1954, a record and nearly six times the receipts of as recent a year as 1947. Records will probably be falling annually for the next five years. Airlines expect to fly 250 million ton-miles of freight this year, compared to 233.2 million in 1953, the previous high. Mr. Johnson believes: "Ton-mileage will reach 625 million by 1960."

GE Starts Reactor Sales

An industrial sales program for nuclear research reactors will be launched this month by the new atomic power equipment department of General Electric Co., Schenectady, N. Y.

The program includes seven steps to help customers obtain and operate reactors: 1. Preparation of reactor specifications. 2. Co-ordination of building study and assurance of proper housing of reactor. 3. Preparation of a hazards summary report to aid in obtaining AEC approval. 4. Manufacturing the reactor. 5. Installation of the reactor at buyer's location. 6. Starting up reactor, assuring proper operation. 7. Providing reactor service.

$10-Million Headache Solved

Otis Elevator Co., New York, estimates that it will save $120,000 a year by installing a new electronic computing machine to control inventory.

The equipment will keep tabs on more than 35,000 items from the $10-million stockpile Otis needs to build new elevators and service old ones. The control system will cost somewhat over $200,000 installed.

The following operations will be handled automatically:

1. A continuous record of how much of each inventory item is on hand, how much on order and rate of use of the item will be kept.

2. Warning will be given when it becomes necessary to re-order and a record of open orders will be kept.

3. Expediters will get a daily record of all items that are going on shortage and all contracts affected by these shortages.

4. Information will be provided for scheduling production to meet contract dates.

Business Weather: Sunny, Warm

That's the Commerce department's forecast for the rest of the year. It predicts new sales and production records in many metalworking areas

MAJOR INDUSTRIES will register an all-time high production and sales record this year. This prediction, says Sinclair Weeks, secretary of commerce, is based on a survey conducted by the 25 industry divisions of the Business & Defense Services Administration.

Iron & Steel—Advance orders are strong. The Commerce department warns that some seasonal decline is anticipated, but that the last half should bring this year's total close to the 1953 peak of 111.6 million ingot tons.

Copper—Consumption will be up 25 per cent. While production of refined copper should gain about 25 per cent over the last half of 1954, a decline in imports will cut supply to about 10 per cent above the last half of 1954.

Aluminum—Shipments will set a record of some 3.5 billion pounds. This is 500 million pounds more than the industry predicted at the beginning of this year and will be 700 million pounds over 1954 shipments.

Automotive—Peak year was 1950 when 6.7 million units were produced. In the first half alone, 4.3 million cars came off the production line. Trucks are also running well toward their 1950 goal when 1.3 million units were produced. Production of truck trailers is about 63 per cent above 1954. Automotive parts manufacturers are also having a banner year. Volume in the replacement parts field will account for $2 billion.

Freight Cars—During the next three months, 20,000 new units will be ordered. Only 9933 went on the order books during the second quarter.

Building—Construction will surpass its 1954 record of $37.6 billion. The Commerce department survey indicates that all construction combined will total $41.8 billion.

Electrical Equipment—This industry will continue to operate at an annual rate of some $4.5 billion, or about 12 per cent over 1953, but 5 per cent below the peak year of 1954. Electronics manufacturers are now expecting to reach $6.2 billion, or within a shade of the record $6.3 billion reached in 1953. Sales in 1954 totaled $5.8 billion.

Machine Tools—Shipments during the last six months of this year are expected to be about $280 million. This would give the industry a $670 million year which compares with a total of about $1 billion in 1954. Machinery sales—agricultural, construction and oil field—will increase from 8 to 25 per cent, says the Commerce report.

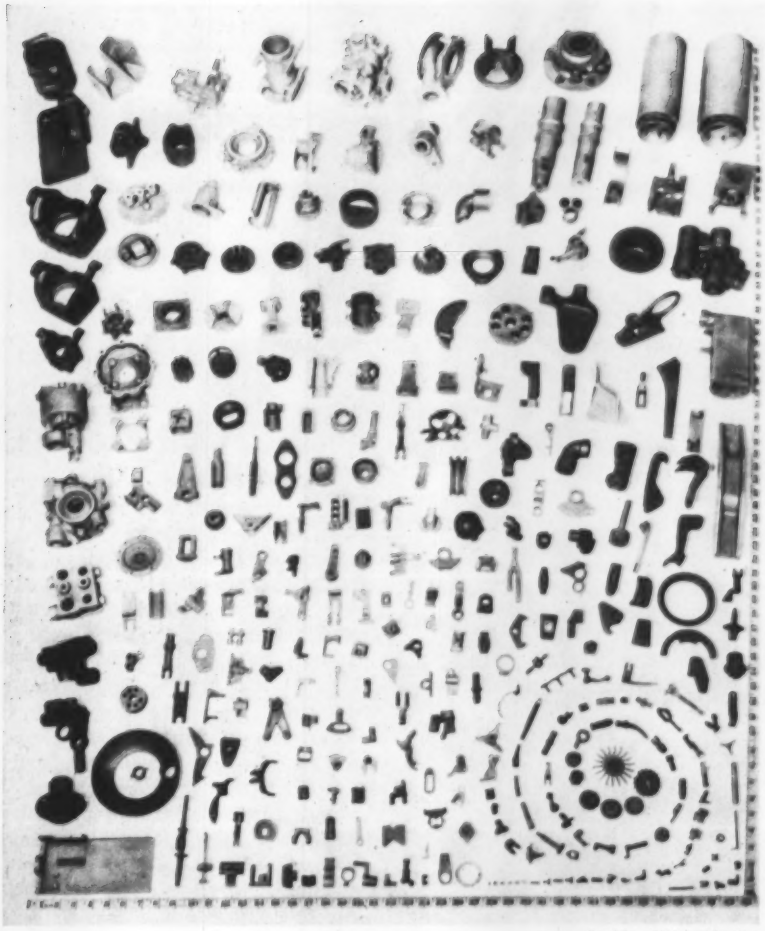
Press Forms Fin Edge

General Dynamics Corp.'s Convair division at San Diego, Calif., uses a triple-action press to form the leading edge of a dorsal fin. Two press operations form 0.032 gage, 24SO aluminum over a narrow plastic die reinforced with a steel base plate. Output can reach 15 parts per hour

NYC Adopts Centronic

For its lines east of Buffalo the New York Central will have Teleregister Corp., Stamford, Conn., install an electronic-controlled central reservation system called Centronic.

Heart of the system is a centrally located reservations equipment office and electronic control with a high-speed magnetic drum storage unit.



Precision Metalsmiths Inc.

New precision brings new applications as . . . .

Investment Casting Comes of Age

SALES ARE UP, castings are bigger and more intricate, more companies are entering the field—that's the picture of the investment casting industry.

The investment casting process was used to make statues in Egypt and Sumeria about 3000 B.C.; Benvenuto Cellini used it to create his bronzes; in the last 50 years dentists adopted the method. About 1930 the process was applied to large-scale production in the jewelry industry.

The Start—First industrial use was about 1940 when the gas turbine made its debut in aircraft. General industrial applications started in 1946. Sales in 1954 were $120 million, estimates the Investment Casting Institute. This year they may hit $140 million.

Three pattern materials are used to make investment castings: Wax (the historic lost wax process), plastic and frozen mercury. Most common is the wax process—66 per cent of investment casters use it, 23 per cent use plastic, 8 per cent use both wax and plastic and 3 per cent use frozen mercury.

Getting Bigger — Investment castings weighing up to 50 lb with maximum dimensions of 18 in. are not unusual. The frozen mercury process has produced castings with dimensions over 42 in. weighing over 300 lb.

There are now 143 investment casters in the United States and Canada, an increase of 30 in the last two years.

Who Buys?—Best customers are the aircraft and electronics industries. About two-thirds of all work is for defense use. Investment casters are attempting to diversify by doing more work for makers of printing, sewing and textile machinery; packaging and business machines; and food machinery. Investment casters think food machinery offers an especially good potential.

Advantages—Design freedom is a major selling point for the investment process. Alloy Precision Castings Co., Cleveland, tells of one casting produced by the frozen mercury process that replaced a 27-part fabricated assembly. The slogan of Precision Metalsmiths Inc., Cleveland, is: "Pour yourself an assembly." It produces castings in over 250 alloys.

Tolerances are ± 0.005 in. or better for each linear inch. As cast, surface finishes of 70 to 90 microinches in nonferrous metals and 100 to 125 microinches in ferrous metals are produced. Minimum wall thicknesses are 0.030 in. and 0.050 in. respectively. The close tolerances make it possible to use metals difficult to machine.

An additional advantage of the investment process is the use of plastic patterns in design determination. With polystyrene patterns, castings can be made before tooling is started. Any needed changes can be incorporated at minimum cost.

Man-Made Island Goes to Sea

A 6000-ton Texas Tower left Boston harbor last week headed for permanent installation about 110 miles east of Cape Cod.

Towing the platform to the site and erecting it is a joint venture of DeLong Corp. and Raymond Concrete Pile Co., both of New York. When complete, the radar island will be anchor man in a picket line of atomic war defense units protecting 1500 miles of coast line from Newfoundland to Norfolk, Va.

The Texas Tower, like its offshore oil drilling counterpart, is unique in that it can be fabricated and towed into service where on-the-site construction is impossible.

To our Favorite Boss!

From the receptionist at the front door through to the last man on the loading platform—*all* of us here at Great Lakes Steel have a very important *something* in common. It is the knowledge that your continued and expanded need for our products determines the future and growth of every one of us, regardless of our individual jobs here.

It is the knowledge that *you*, Mr. Customer, are the boss!

That's why we at Great Lakes are seeing to it that our steel is the kind you have a right to expect from a specialist in flat-rolled products. We know the importance of prompt shipments, top quality, proper packaging and loading, dependable information, and clerical accuracy. We think you'll agree that our many satisfied customers are a pretty good indication that this policy is good business for all concerned.

Next time you have a problem in steel, call on one of our representatives to help you solve it. You'll be glad you did!

GREAT LAKES STEEL CORPORATION
Ecorse, Detroit 29, Mich. • A Unit of
NATIONAL STEEL CORPORATION

PRODUCER OF NAX HIGH-STRENGTH STEEL

SALES OFFICES IN BOSTON, CHICAGO, CINCINNATI, CLEVELAND, HOUSTON, INDIANAPOLIS, LANSING, LOS ANGELES, NEW YORK, PHILADELPHIA, PITTSBURGH, ROCHESTER, ST. LOUIS, SAN FRANCISCO AND TORONTO

GM Emphasizes Basic Research

With Physicist Lawrence Hafstad as the new director, odds are GM will give more attention to fundamental science and engineering research

SELECTION of a physicist and leading atomic energy scientist, Lawrence R. Hafstad, as director of the General Motors research staff, could imply that GM is newly interested in the smaller things of life.

While it is perhaps not illogical for an outsider to assume that a retired race car mechanic might be closer to the mark for a company primarily associated with the automotive field, an understanding of the nature of GM research helps clarify the appointment of Mr. Hafstad.

Changing Times—During the last half-century, businessmen have increasingly realized the virtues of conducting basic investigations in pure science without immediately recognizable commercial objectives. Whether this research is done directly by the company or done by a university and supported by company funds, its universal characteristic is the exploration of a basic problem area without the objective of immediate solution of a specific problem.

With larger companies such as General Motors, much research of this sort can be done by the company itself and examples of such extensive long-range studies include magnetism, combustion and friction. Although it may readily be seen that advancement of knowledge in these areas might well be translated into product improvement, it is equally evident that in themselves they constitute only general areas of research.

The Limits—A good example of a long range study now underway at GM research is analysis of photosynthesis. Granted that this would be pure research, it lies in a field not immediately related to the products and objectives of General Motors Corp. And this is not justifiable as a relevant problem area. The differentiation thus to be made is that while the areas lie in the realm of pure science, the results achieved may bear some relationship to the specific problems which have arisen or are likely to arise in product development.

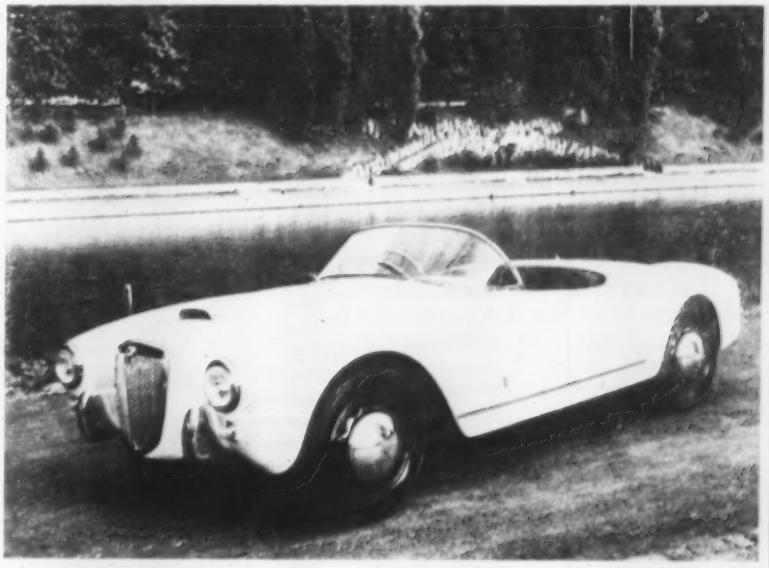
That is only one part of the story, however. In addition to fundamental science research, engineering research and advanced engineering development more directly related to the products and their problems also are done by GM research.

Kinds of Research — As contrasted to fundamental science research projects seeking more general information, engineering research attacks the fundamental engineering problems encountered in developing new products. Although the differentiation must be made between fundamental science research and fundamental engineering research, both aim at broad basic studies that have wide applications. In this sense, the latter may be said to approach pure engineering problems in the same sense that the former approaches pure science problems.

The third area begins to move into the translation of the information gained in pure science and pure engineering research projects into usable products and processes. Its objective is the development of working samples to demonstrate new principles. For while the 1300 people at GM research do only a fraction of the research that is done in General Motors Corp., since each division is responsible for the development and engineering of the product it sells, the results of GM research work are available to any division which has a need for them.

For that reason, clarification of the possibilities implicit in knowledge learned is a big part of the job.

Two-Way Street—One interesting part of the relationship, how-



New Italian Sport Car is a V-6

The Lancia Spyder has a De Dion rear end incorporating transmission, clutch, differential and brakes in one unit at the back axle. Made by one of Italy's oldest motor car companies, the two passenger car has a dual exhaust engine capable of 115 mph. It will be marketed exclusively in the United States

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ever, is the fact that knowledge not only comes out of GM research, problems also go in. A division which uncovers a problem in its product development which cannot be solved with knowledge available can contribute to the formation of a new task force aimed at finding the answer. But task forces already in operation usually have a convenient pigeonhole for the new job.

A quick run-down of the applied science departments includes the physics and instrumentation department which carries out active projects in spectroscopy, x-ray, ultrasonics, etc. This department also develops new instrumentation for projects carried on by other departments and has made important contributions in the application of the electron microscope in metallurgical research.

Case in Point—The fuels and lubricants department works continuously to discover more about petroleum base fuels and lubricants including the relationships between the nature of combustion and the environment within the engine. In addition to the discovery of tetraethyl lead as a knock suppressor, they have made many fine contributions in fundamental studies of combustion and hydro-carbon chemistry.

The metallurgy department handles such problems as the development of new alloys and new processes. Working with both ferrous and nonferrous materials, the department turned out Aldip, the aluminum dipping process.

Coming Up—The chemistry department scrutinizes chemical materials used or potentially useful to the automotive industry. A large amount of work on improving the durability of automobile finishes and protective lacquers is done. A very recent development is a new paint comprised of lacquer and enamel which may eliminate the need for polishing a car.

The electro-chemistry department combines two separate functions: Electroplating and rubber and plastics work. The first is concerned with new developments and problems in electroplating. The rubber and plastics section works on the evaluation and compounding of new rubbers, adhesives and plastics.

Development—In addition to the applied science departments listed above, the division also has a number of mechanical departments composed largely of mechanical engineers. One of this group is the engineering mechanics department. A typical project of this group is crankshaft fillet rolling to increase fatigue life, for they are concerned with fatigue studies and stress analyses of materials and parts. Out of this fundamental work has come shot-peening and other mechanical treatments which increase fatigue life of parts. A comparison of a new and old type of ring gear summarizes the results of this work. In 1930, a 90 hp engine required an 11-in. ring gear. Now a 7-in. ring gear is used with an engine of over 200 hp.

The automotive engines department, as the name implies, concentrates on development of more efficient piston-type automotive engines. Studies of basic engine design and specific engine components coupled with fuel economy, octane requirements, carburetion and other performance factors have been largely responsible for present high compression engines used by GM.

Samples—The mechanical development department is concerned with a variety of projects such as unconventional engines, diesel engines, fatigue testing, friction, lubricants and bearings. Work on fundamental friction is concerned with metals sliding on metals to attempt to discover why certain metals are compatible with regard to friction and others are not.

Such problems as balancing and vibration and noise are the province of the special problems department. Balancing machines used for the production balancing of rotating parts are sold by the research laboratories division. Chevrolet's new engine balancer is so sensitive, thanks to such work, that the weight of lubrication oil in crankshaft ports in itself is more than the ultimate tolerance for the entire Chevrolet V8 engine.

In addition, there are such obvious departments as the gas turbine department and servicing departments to the entire research setup.

Birthplace—During the 33 years of its existence, the Research Laboratories Division has played an important role in such developments as ethyl gasoline which resulted in the formation of a new firm, Ethyl Corporation. Developments in such fields as powder metallurgy resulted in the formation of Moraine Products Division.

Other developments number such items as domestic mechanical refrigeration, lacquer finishes, static and dynamic balancing machines, bright copper plating, safety glass, quantitative spectrographic analysis, triptane process, copper-lead bearings, instantaneous silver plating process and tellurium-treated malleable iron.

Now completing its move into ultra-modern facilities as futurish as its thinking, GM research is better equipped to contribute not only to the corporation of which it is a part, but to industry as well.

Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,780	594,467
February	770,530	574,215
March	955,027	672,858
April	936,994	676,269
May	913,257	621,318
June	825,031†	635,540
July		543,540
August		523,799
September		364,441
October		312,078
November		616,395
December		761,954
Total		6,896,874

Week Ended	1955	1954
June 11	172,794	139,312
June 18	178,475	140,063
June 25	191,890	140,695
July 2	195,071	133,141
July 9	171,605†	106,169
July 16	165,000*	130,763

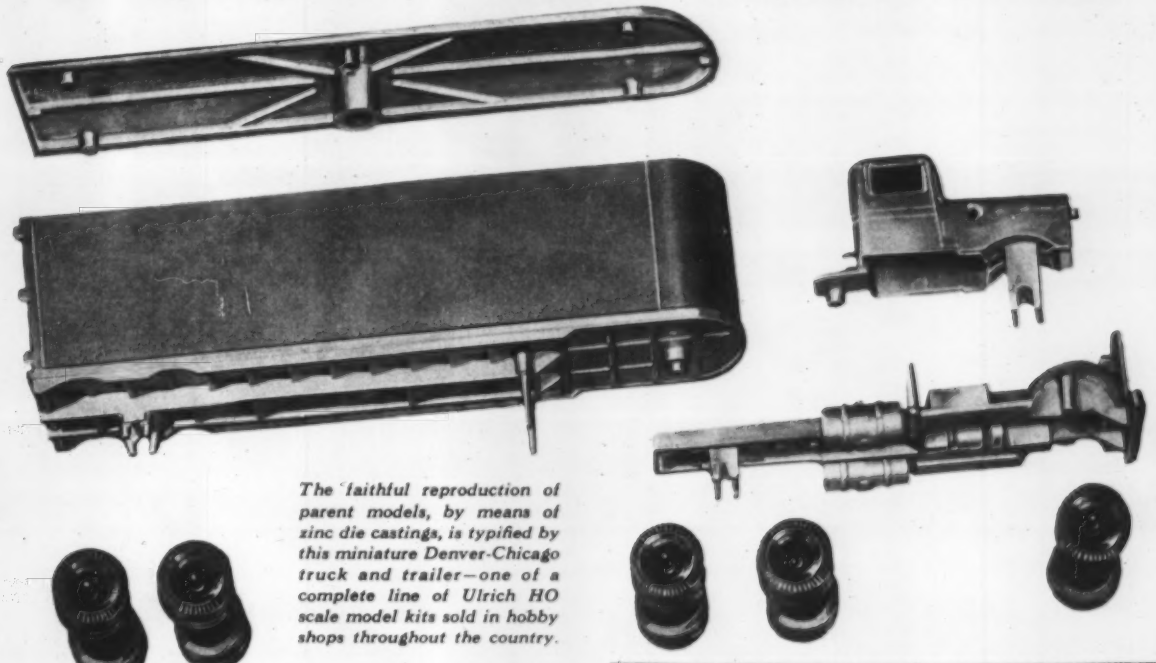
Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

TV Rules the Road

Four TV cameras keep a sharp electronic eye on traffic in a ½-mile highway tunnel of the West Virginia turnpike.

Thanks to TV a trouble spot can be spotted immediately; if necessary a turnpike trouble car can be sent to the spot where it is needed. The Michigan City, Ind., plant of Dage Television Division of Thompson Products Inc. produced the camera and monitoring equipment.

WHY ZINC RATES FIRST IN DIE CASTING • NUMBER 4 OF A SERIES



The faithful reproduction of parent models, by means of zinc die castings, is typified by this miniature Denver-Chicago truck and trailer—one of a complete line of Ulrich HO scale model kits sold in hobby shops throughout the country.

clean-cut detail as featured by ULRICH

The ability to produce ZINC die castings with exacting, clean-cut detail is best illustrated by a few of the many castings employed in the scale model field. These Fruehauf trailer-truck components not only endow the Ulrich model kits with an appearance and "feel" of realism, but with extremely accurate HO scale dimensions (5/32"–1 ft.). And the ZINC die castings produced in long production runs are as alike as peas in a pod—without the need for elaborate machining.

Other ZINC die casting advantages utilized in scale model production (and in many other fields) are: *toughness*—to withstand rough usage; *smooth as-cast surfaces*—to take, and hold, any type of commercial finish; *integrally cast elements*—to provide economical and trouble-free means of assembly; *complexity of shape*—to make one part serve in place of several.

For other examples of product engineering with ZINC die castings in other fields, watch for our ads in this magazine in the months ahead. Send for our new brochure and contact any commercial die casting company regarding your particular production problems.

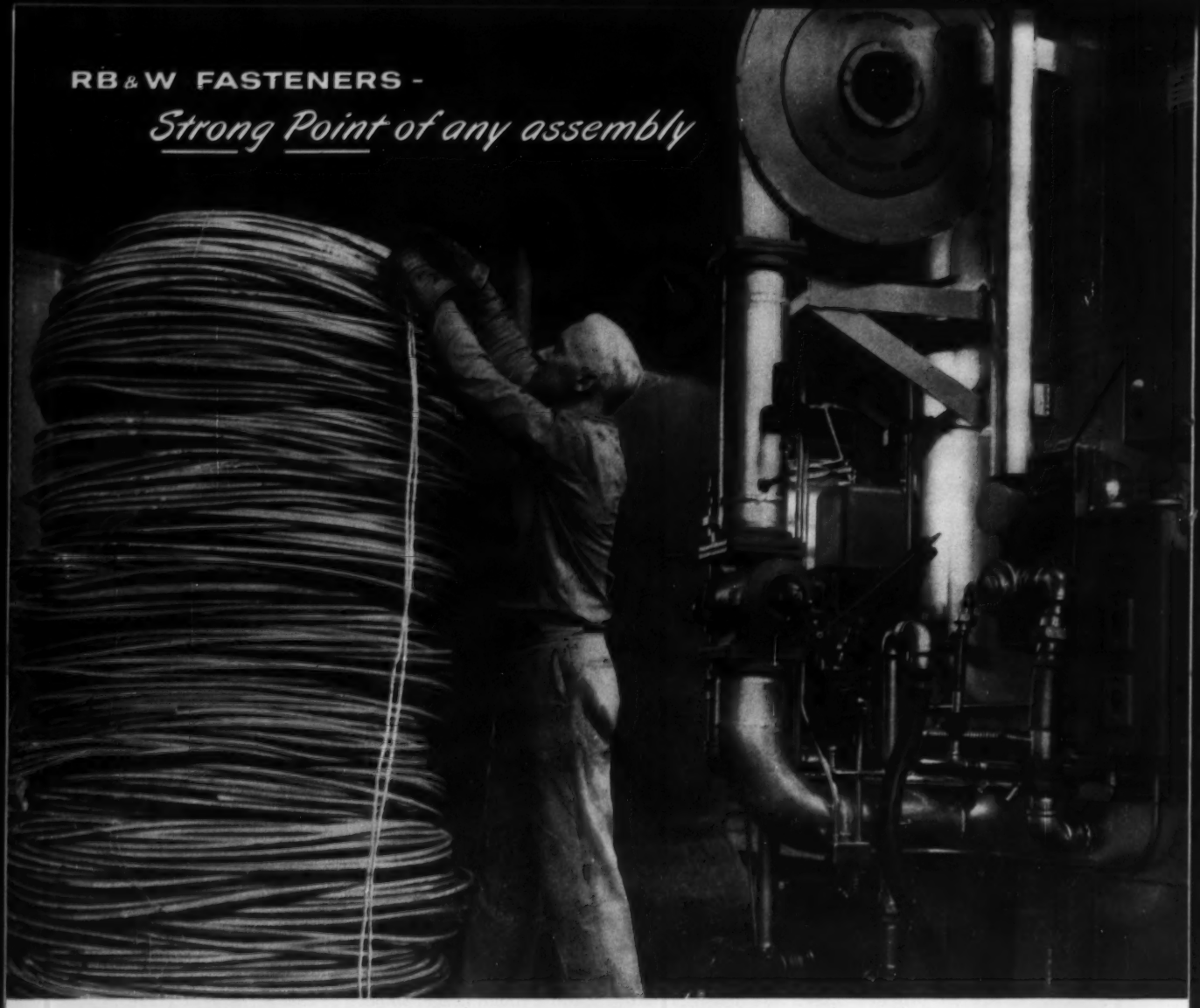
The New Jersey Zinc Company, 160 Front Street, New York 38, N. Y.

ZINC
FOR DIE CASTING ALLOYS

The Research was done, the Alloys were developed, and most Die Castings are based on
HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

RB&W FASTENERS -

Strong Point of any assembly



Where the heat's on to lift bolts and nuts out of the ordinary

You won't see these spheroidizing furnaces in many bolt and nut plants. They call for a big investment of money. But to a company that wants to be sure of conditioning metal for the best bolt and nut possible, they're worth it.

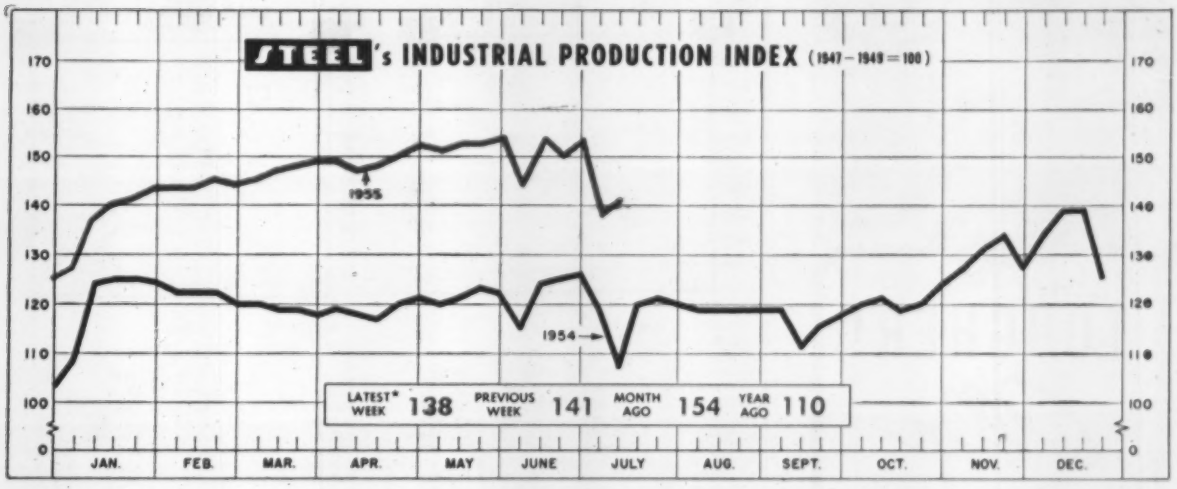
In the photo above, you see R. M. Hubley setting up to anneal coils of wire rod to change its structure for the better. Next, he'll hoist the furnace at right, setting it down over the stacked coils. This special equipment makes it possible to accurately control the heating, cooling and the atmospheric conditions inside the housing.

Working with the most modern and complete facilities, RB&W men can bring to bear the full extent of their experience. And experienced they are . . . most have long years of service in the company. Some have followed their fathers' and even grandfathers' footsteps.

It's this combination of equipment, experience and quality control throughout RB&W plants that assures you more quality for your money . . . a reliable source of supply . . . and strong fasteners that never let you down.

Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

Plants at: Port Chester, N. Y., Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** New Orleans; Denver; Seattle. **Distributors** from coast to coast.



*Week ended July 9. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Auto Assemblies 11%.

More New Plants Add Spice to the Building Boom

INDUSTRIAL CONSTRUCTION is destined for a bigger spot in the building boom. A mediocre performer last year when the construction industry set all sorts of dollar volume records, industrial building last month was at the highest level —$189 million—ever recorded for a June month, says the Commerce department.

Pointing toward an even brighter outlook ahead are contract awards. For the first 6 months of this year they were 31 per cent ahead of the same period of a year ago, reports *Engineering News-Record*. Much of the increase came along in the second quarter as businessmen became more certain that the quickening recovery from 1954's dip was no flash in the pan with an even sharper slip-back coming along.

Reinforcement—Also indicating a continuing climb in industrial building are businessmen's own plans for the rest of the year. Numerous surveys report that plans for acquiring new plant and equipment are being stepped up and expanded.

STEEL's own midyear forecast (June 27, p. 37-40) shows three in ten metalworking executives expect to start new expansions this year. New plants will be built by 22 per cent of them. Another 45 per cent will add to present plants, and 95 per cent will add equipment.

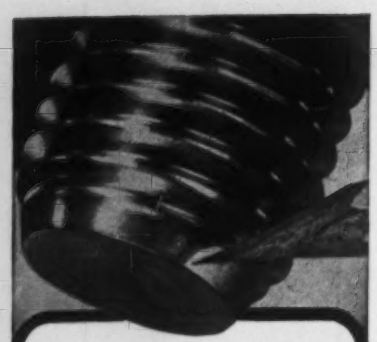
Outlook — That means added strength in the construction framework and in industrial building in particular. Most of the new plans, though, won't show up much before August. June, for example, gave a preview of a slowdown during the summer. Contract awards for industrial construction slipped to a weekly average of $44 million, compared with $65 million in April (the best month since December, 1953) and May's $64 million weekly.

That one-third drop may look big, but it's not nearly so large as last year when the May-to-June slip was more than 50 per cent. The picture looks even better when you consider that this year's June

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,233[1]	2,073	1,534
Electric Power Distributed (million kw-hr)	9,725[1]	10,138	8,185
Bitum. Coal Output (1000 tons)	2,175	9,590	1,474
Petroleum Production (daily avg.—1000 bbl)	6,625[1]	6,610	6,281
Construction Volume (*ENR*—millions)	$378.9	$439.1	$298.5
Automobile, Truck Output (*Ward's*—units)	171,605[1]	195,071	106,169
TRADE			
Freight Car Loadings (1000 cars)	642[1]	696	570
Business Failures (Dun & Bradstreet, no.)	228[1]	231	196
Currency in Circulation (millions)[3]	$30,298	$30,021	$30,154
Dept. Store Sales (changes from year ago)[3]	+4%	+6%	+18%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,319	$21,756	$17,170
Federal Gross Debt (billions)	$274.4	$277.5	$271.3
Bond Volume, NYSE (millions)	$17.3	$19.7	$16.2
Stocks Sales, NYSE (thousands of shares)	11,565	11,541	9,256
Loans and Investments (billions)[4]	$84.4	$84.4	$81.1
U. S. Govt. Obligations Held (billions)[4]	$32.1	$32.3	$33.7
PRICES			
STEEL's Finished Steel Price Index[5]	207.76[1]	194.53	194.53
STEEL's Nonferrous Metal Price Index[6]	238.9	238.7	215.8
All Commodities[7]	110.0	110.0	110.0
Commodities Other than Farm & Foods[7]	115.7	115.7	114.2

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.



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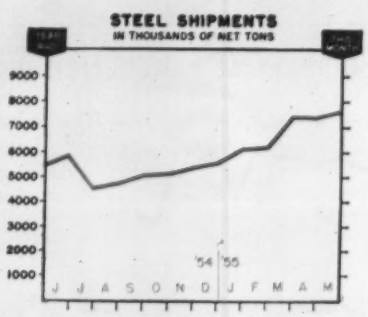
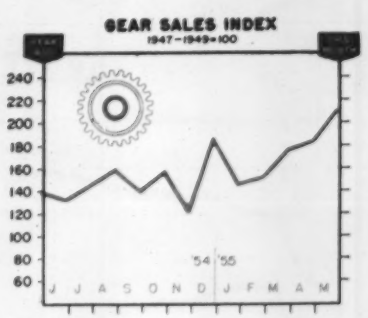
ALLEN

MANUFACTURING COMPANY

Hartford 2, Connecticut, U.S.A.

THE BUSINESS TREND





	Net Tons 1955	1954	1953
Jan.	6,009,958	5,727,600	7,067,636
Feb.	6,119,900	5,364,978	6,533,227
Mar.	7,268,795	5,583,690	7,436,919
Apr.	7,279,321	5,287,972	7,162,460
May	7,540,889	5,423,168	7,209,396
June	5,887,488	6,950,059
July	4,490,179	6,582,513
Aug.	4,681,242	6,498,605
Sept.	5,004,222	6,400,757
Oct.	5,035,364	6,726,850
Nov.	5,240,209	5,903,980
Dec.	5,448,649	5,684,920

American Iron & Steel Institute.
Charts Copyrighted, 1955, STEEL.

	1955	1954	1953
Jan.	140.9	167.4	161.4
Feb.	148.5	165.1	188.1
Mar.	172.8	128.6	158.9
Apr.	179.8	158.2	217.1
May	205.2	132.5	189.8
June	....	127.4	146.5
July	....	141.3	120.7
Aug.	....	154.7	121.6
Sept.	....	135.1	135.6
Oct.	....	152.3	211.1
Nov.	....	116.7	144.9
Dec.	....	182.2	194.0

American Gear Mfrs. Assn.

total is 24 per cent larger than the 1954 month.

More Building Records Set . . .

The over-all outlook for construction? It's highly favorable, says F. W. Dodge Corp. Dodge reports another record set in June, highest total for any June in the company's 64 years of construction news reporting. Total for the first six months of the year is 30 per cent ahead of the same period of 1954. The $12 billion in contract awards for future construction was an all-time high for a first half.

And while contracts are being let at a record pace, actual spending for construction is likewise at a new peak, $19.1 billion in the first half, reports the Commerce department. That represents a seasonally adjusted annual rate of $41.7 billion. If the building steamroller keeps moving as it is now, it would take a terrific dent to keep 1955 from eclipsing the 1954 record of $37.6 billion.

PAs Say Business Is Good . . .

Slightly better delivery situation, longer lead time in buying policy and higher prices during the summer are indicated in the latest report of the Business Survey Committee of the Purchasing Agents Association of Chicago.

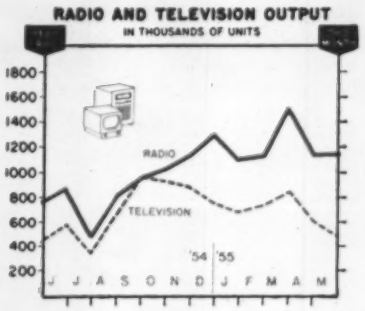
The trend toward lengthening delivery times showed signs of slowing down in June, say the PAs. Most of them report schedules about the same as in May. The number reporting slower deliveries is the smallest since February.

Inventories are holding about even. Those reporting smaller inventories took a 5-per-cent jump; the number with higher stocks dropped by the same amount, indicating that inventories are pretty much where users want them to be.

Employment Holds Up . . .

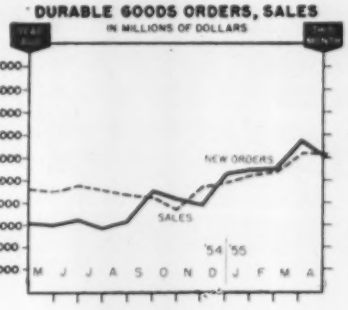
Production remains high, with 91 per cent (the same number as a month earlier) saying output is holding steady or increasing. That shows up in the employment situation. Only 4 per cent note lower employment than a month ago. The rest say their work force is the same or larger.

Backlogs tended to go down, but in view of the over-all picture order books are still well filled. In general, volume continues strong while profits show signs of weak-



	Radio		Television	
	1955	1954	1955	1954
Jan.	1,068	872	655	421
Feb.	1,090	769	703	427
Mar.	1,482	940	831	600
Apr.	1,100	745	583	458
May	1,114	722	467	396
June	....	838	...	544
July	....	438	...	307
Aug.	....	785	...	633
Sept.	....	932	...	948
Oct.	....	998	...	921
Nov.	....	1,099	...	859
Dec.	....	1,262	...	833
Total	....	10,400	...	7,347

Radio-Electronics-Television Mfrs. Assn.



	New Orders*		Sales*	
	1955	1954	1955	1954
Jan.	12,142	9,376	11,850	11,381
Feb.	12,170	9,394	12,029	11,248
Mar.	13,353	9,585	12,860	11,303
Apr.	12,684	9,619	12,819	11,160
May	....	9,588	.....	11,066
June	.....	9,822	.....	11,293
July	.....	9,407	.....	11,153
Aug.	.....	9,756	.....	10,907
Sept.	.....	11,153	.....	10,832
Oct.	.....	10,790	.....	10,295
Nov.	.....	10,491	.....	11,314
Dec.	.....	11,963	.....	11,570

*Seasonally adjusted. U. S. Office of Business Economics.

ening. That's probably a reason for some of the higher prices.

In response to a special question, about one-fifth of the PAs said they thought a supplemental unemployment plan was workable in their industry — but that leaves four-fifths who think it isn't. Six per cent said they already have SUP in one form or another. Another 1 per cent expect to have it within a year.

Associations Report . . .

Metalworking industries continue to report good business. National Screw Machine Products Association, for example, reports May new orders were up 61 per cent over the same month of last year. Shipments were 32 per cent higher. Unfilled orders remained relatively unchanged, 8.0 weeks as of May 31, compared with 8.1 weeks a month earlier

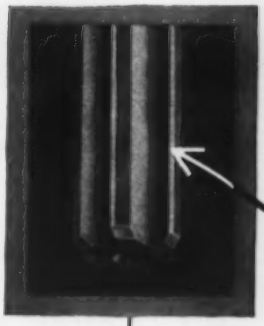
Foundry equipment orders in May slipped a little from their lofty April figure of 178.6 (1947-1949=100) but at 145.7 far overshadowed last year's May total of 80.8, as measured by Foundry Equipment Manufacturers Association's index.

Commercial heat treaters also had a good month in May, with billings 30.4 per cent higher than a year ago reported by Metal Treating Institute. For the year, billings are up only 3.5 per cent because of relatively low business in January and February. But last year, business fell off rapidly in second quarter. This year it's increasing.

Rail Income Climbs . . .

Railroads, too, are having an easier time of it. Estimated net of 126 Class I roads income in May was $86 million, more than double the $40 million earned in that month last year, according to Association of American Railroads. The comparisons for the first five months are almost as good: $329 million this year, $172 million last.

In the auto sales races: Dealers' stocks declined in June for the first time in eight months. Sales showed signs of slipping early in the month, but the 30,000-a-day rate of the closing 10 days (equal to the record for daily sales over a 10-day period) allowed the month to finish out with a respectable 682,000 sales. The month-end flurry held promise of enough demand remaining for 1955 models to allow an orderly cleanup before the 1956 models are brought out.



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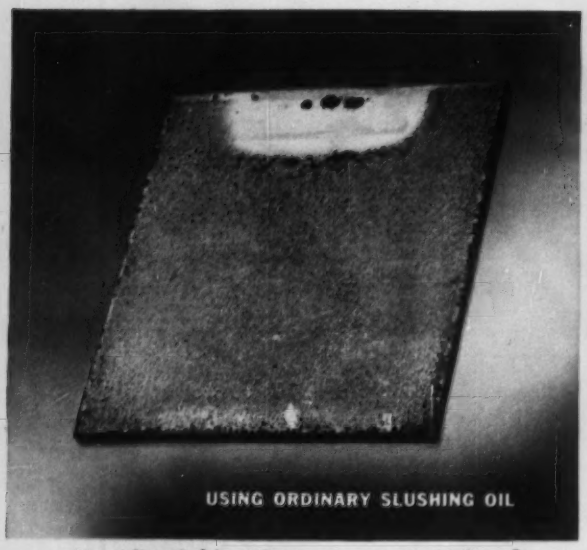

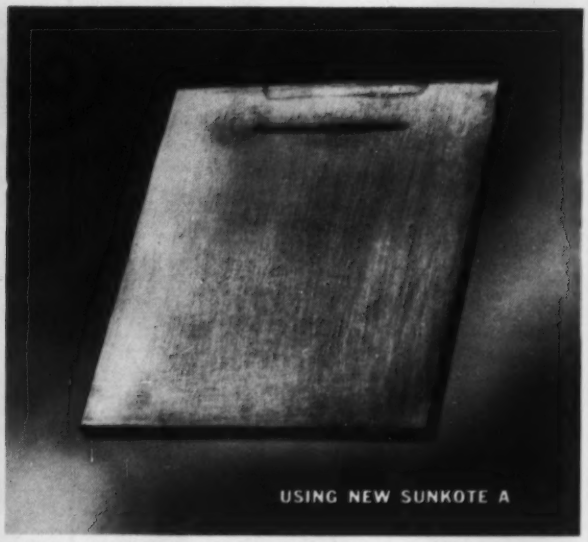

Humidity Cabinet Test proves superiority of new coating oil. Using ordinary slushing oil, steel test panel (on left) shows harmful rust after only 100 hours in humidity cabinet with relative humidity of 100% at 120 F. An identical steel test panel (above right), protected by new Sunkote A, shows no rust or stain whatsoever after 200 hours under same rust test conditions of high humidity and temperature.

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KENNETH R. HERMAN
. . . Vickers Inc. president

GLENN F. IHRIG
. . . Wellman Bronze gen. sales mgr.

FREDERICK C. KROFT
. . . Haynes Stellite manufacturing post

Kenneth R. Herman was elected president of **Vickers Inc.**, Detroit. He was vice president and general manager. **Harry F. Vickers**, founder of the firm, was made vice chairman of the board. **Dr. N. E. Edlefson** was elected vice president-engineering. Mr. Vickers is also president of Sperry-Rand Corp., parent company, and Mr. Herman is vice president.

John J. Brogan was made general sales manager, **Cleveland Pneumatic Tool Co.**, Cleveland. He was with Jefferson Electric Co., recently as general sales manager.

Morse Chain Co., Borg-Warner Corp. subsidiary, elected **Donald H. Spicer** vice president-sales and **Chester J. Spacher** sales manager, chain drive department. They will have headquarters at Ithaca, N. Y.

Alan D. Kattelle was made assistant general purchasing agent of **American Brake Shoe Co.**, New York.

Robert F. Kendall was made general purchasing agent, **Reliance Electric & Engineering Co.**, Cleveland. Formerly manager of material control at the Euclid, O., plant, he succeeds **Clifford C. Tippit**, resigned. **Ralph G. Davis** was made manager of manufacturing for the Euclid control division.

Glenn F. Ihrig was promoted from assistant sales manager to general sales manager of **Wellman Bronze & Aluminum Co.**, Cleveland.

Charles F. Simmers was elected vice president-engineering, **Morgan Engineering Co.**, Alliance, O. He succeeds **William L. Ditges**, retired.

Alfred Fleissig was made general sales manager, **Loewy-Hydropress Inc.**, New York. He continues as director of purchasing. **Frederick A. Fielder** was made assistant to the general manager of Loewy Construction Co., subsidiary.

Lloyd L. Stouffer, formerly secretary-treasurer, **Pangborn Corp.**, Hagerstown, Md., was elected vice president. **Helen R. Fisher** was named secretary. **John R. Bell** was made treasurer.

Dr. Walter C. Rueckel, vice president of Henry J. Kaiser Co. for the last four years, was elected vice president and general manager, engineering and construction division, **Koppers Co. Inc.**, Pittsburgh.

Max Schlossberg Co., Chicago, elected **John B. Schlossberg** president to succeed **Max Schlossberg**, now chairman of the board. **Paul Becker** was elected executive vice president and **Edwin A. Superfine**, vice president.

Frederick C. Kroft was made general superintendent of manufacturing at **Haynes Stellite Co.**, a division of Union Carbide & Carbon Corp., New York. He was superintendent of the inspection, process and quality control department.

Fred C. Frame was made sales engineer of **Salem-Brosius Inc.**, Pittsburgh. He was vice president of Kidd Drawn Steel Co. and prior to 1951 was staff assistant to the vice president-sales, United States Steel Corp.

National Welding Equipment Co., San Francisco, elected **Henry L. Pohndorf** vice president-sales. He was general sales manager, and served for many years as chief engineer. **William G. Norman** was made chief engineer, **Richard K. Brown** treasurer and **Lois J. Currier** assistant treasurer.

Marvin L. Kaufmann joined **Pioneer Tool Engineering Inc.**, El Segundo, Calif., as assistant to the president. He will manage two subsidiaries, Consolidating Casting Co. and Republic Smelting & Refining Co.

Norman Clayborne was made vice president-sales, Niphos process sales division, **Clayborne Mfg. Co.**, Monticello, Ind.

Albert S. Telkins was made Phila-

delphia district manager for **Rotor Tool Co.**

At U. S. Steel Corp.'s Gary, Ind., sheet and tin mill, **Irvin J. Paul** was named assistant to the general superintendent; **Earl D. Spangler** superintendent, tin mill division; and **John E. Thompson Jr.** superintendent, sheet mill division. Mr. Paul replaces **Ralph P. Deputy**, retired.

Federal Sign & Signal Corp., Chicago, named **Albert T. Guschke** superintendent of plant operations at Chicago.

Clifford A. Clemens was made purchasing agent, **Interstate Drop Forge Co.**, Milwaukee.

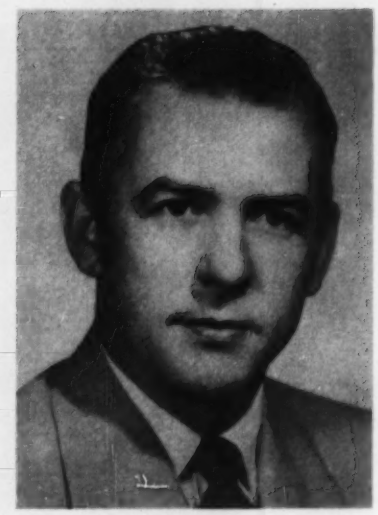
National Iron Co., Duluth, elected **Lewis C. Erickson** president, **Charles Eisenberg** vice president-treasurer, and **George S. Finneman** secretary. **Carl Erickson**, who asked to be relieved of duties as president and gradually from duties connected with the fabricating department, was made honorary chairman of the board. **Lester E. Erickson** resigned as vice president to enter private business.

Marcast Mfg. Co., La Verne, Calif., elected **J. S. Karshauer** executive vice president and general manager, **A. F. Anzlover** vice president-sales, **Irving R. Kramer** vice president and director of research and development, **Henry Maier** secretary-treasurer and **C. H. Rasmussen** assistant secretary-treasurer and comptroller.

V. T. Kitson succeeds the late **L. T. Tierney** as purchasing agent of **Madison-Kipp Corp.**, Madison, Wis.

Rudy Steinbruck was named coordinator of product design and production scheduling, **E. H. Edwards Co.**, South San Francisco, Calif. He is replaced as purchasing agent by **Robert J. LeBlanc.**

Lukens Steel Co., Coatesville, Pa., made **R. Russell Fayles** assistant to the manager of steel plants. **Harry D. George** becomes superintendent of the weld shop, retaining the post of superintendent of production control at the Lukenweld Division. **Warren E. Tobelmann** was made supervisor of the Cleveland sales office.



NORMAN K. ANDERSON

KING DeSEVE

. . . Warner Electric Brake & Clutch vice presidents

Warner Electric Brake & Clutch Co., Beloit, Wis., elected **Norman K. Anderson** vice president-sales and **King DeSeve** vice president-operations. Mr. Anderson was general sales manager. Mr. DeSeve was manager of manufacturing.

E. C. Conary was made general manager, **Genesee Foundry Co.**, Syracuse, N. Y.

Leeds & Northrup Co. appointed **Elwood H. Rogge** manager of its new plant at North Wales, Pa.

E. S. Russey and **A. W. Rose** were elected vice presidents of **Borg-Warner Corp.**, Chicago. Mr. Russey is president and general manager, Warner Gear Division, Muncie, Ind. Mr. Rose is Pacific Coast representative of the corporation at Los Angeles.

E. W. Kettering fills the new post of director of research and **B. B. Brownell** was made chief engineer, **Electro-Motive Division**, General Motors Corp., at La Grange, Ill.

James C. Roberts was made contracting manager in charge of the San Francisco district office of **American Bridge Division**, U. S. Steel Corp. He succeeds **J. R. Fox**, retired.

Charles H. Weaver, who directed the atomic power division of **Westinghouse Electric Corp.** since it was organized in 1948, was elected a vice president in charge of all atomic power activities. **John W. Simpson** was made manager of atomic reactor development at Bettis Field, near Pittsburgh.

D. H. Rowe was made assistant sales manager, **Ridge Tool Co.**, Elyria, O. Before joining Ridge, he spent four years as advertising manager for Cleveland Worm & Gear Co. and its affiliate, Farval Corp. He formerly was associate editor of *New Equipment Digest*, a Penton Publishing Co. publication.

Homer R. Brown fills the new post of sales manager, Milwaukee steel service plant, **Joseph T. Ryerson & Sons Inc.**

George J. Basl was made product design engineer for **Viking Air Conditioning Division**, Cleveland, National-U. S. Radiator Corp.

Max D. Ribakoff, eastern sales manager, Detroit Steel Co., was appointed a special representative in the eastern district by **Solar Steel Corp.**

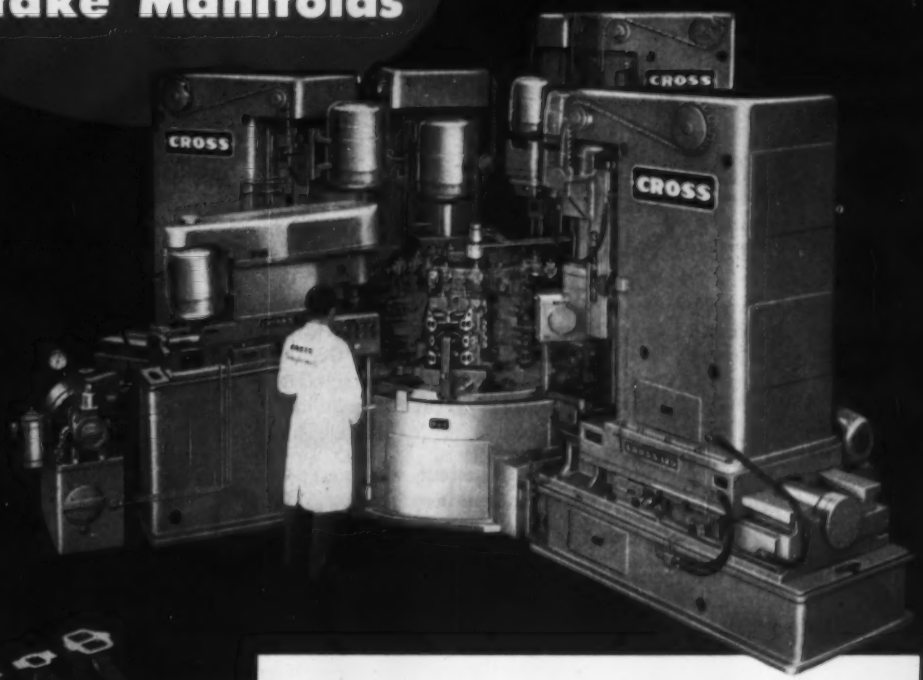
Ralph J. Eschborn was appointed chief engineer of **Jack & Heintz Inc.**, Cleveland.

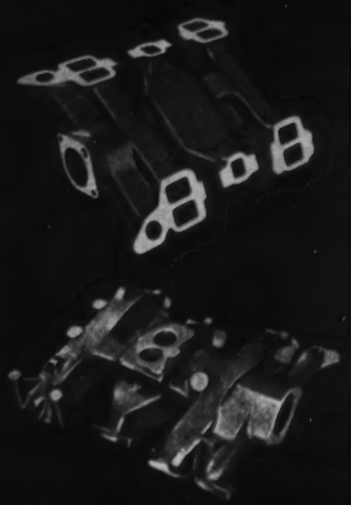
Orville W. Barnett, manager of Nordstrom valve distribution and oil field sales for **Rockwell Mfg. Co.**, Pittsburgh, was named assistant to the vice president, meter and valve division.

Abraham Smaardyk was appointed associate director, nuclear engi-

Mills and Drills 2 and 4 Barrel Intake Manifolds

Another Special by Cross





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. . . heads Harbison-Walker basic sales

GEORGE A. WATERMAN
. . . Kaiser Aluminum extrusion mgr.

neering department, **Edward Valves Inc.**, East Chicago, Ind., subsidiary of Rockwell Mfg. Co.

Kenneth P. Martin succeeds the late **E. D. Frank** as vice president-sales, **National Automatic Tool Co.**, Richmond, Ind. He has been general sales manager since August, 1954. Before joining Natco, Mr. Martin was general manager, Hydroform Corp., and later was general sales manager, process machine division, Cincinnati Milling Machine Co. **Ralph Cox** was made Buffalo regional sales manager and **Lou Maef** supervisor, West Coast dealer activities, Los Angeles. District sales engineers are: **John Stamback**, Cleveland; **Walter McKenzie**, Philadelphia; **Ken Gorton**, Detroit; and **Maer Franks**, Chicago.

Ronald C. Beckett was appointed chief engineer, oil filter division, **Michiana Products Corp.**, Michigan City, Ind. **James W. Volk** was made sales manager, steel fabricating division.

Frank P. Shonkwiler was made manager of basic sales, **Harbison-Walker Refractories Co.**, with headquarters in Pittsburgh. He was a member of the Chicago district sales staff.

H. K. Breustedt was named vice president-engineering of **Diesel Energy Corp.**, New York.

Robert H. Kaltenhauser, John E. Mosser Jr. and **David L. Raymer**, metallurgists, were added to the technical staff of **Allegheny Ludlum Steel Corp.'s** research laboratory in Brackenridge, Pa.

V. B. Baker fills the new post of assistant engineering manager, executive department, East Pittsburgh divisions of **Westinghouse Electric Corp.**

George C. Stewart Jr. was named sales director for the new sales division of **Dalmo Victor Co.**, San Carlos, Calif. He was assistant to the president of Fletcher Aviation Corp.

George A. Waterman was appointed extrusion manager for **Kaiser Aluminum & Chemical Sales Inc.**, Oakland, Calif. He was assistant manager, Midwest division, Revere Copper & Brass Inc. Mr. Waterman succeeds **W. B. Thomas** who was named manager of the new order division.

J. Stanley Hall was made sales director, chemical specialties division, **Pennsylvania Salt Mfg. Co.**, Philadelphia.

F. R. Middleton was named field sales manager, tools, for the **Herbrand Division** of Bingham-Herbrand Corp., Fremont, O.

Ernest Nuber was made general field sales manager for **Bristol Co.**, Waterbury, Conn.

Henry C. Ashley was made assistant director of metallurgy, **Chase Metal Works**, Chase Brass & Copper Co., Waterbury, Conn.

OBITUARIES . . .

C. Howard Paul, 61, former vice president, secretary - treasurer, **Mackintosh-Hemphill Co.**, Pittsburgh, died July 3. When Mackintosh-Hemphill became a division of E. W. Bliss Co. May 1, Mr. Paul was made assistant treasurer for the organization.

A. R. Lambert, 66, chairman of the board of **Lambert Inc.**, Dayton, O., died July 1.

Carl A. Plocher, 74, president, **Andrew Plocher Sons Co.**, Dayton, O., died June 23.

August E. Blessing, 76, president-treasurer, **MSW Mfg. Co.**, Buffalo, died July 1.

Fred Lasker, 74, vice president, **Lasker Boiler & Engineering Co.**, Chicago, died July 1.

John L. Ploss, secretary-treasurer, **Bryant Machinery & Engineering Co.**, machine tool distributor, Chicago, died July 3.

C. Reid Collins, 59, purchasing agent, **Worthington Corp.**, at Buffalo, died July 2.

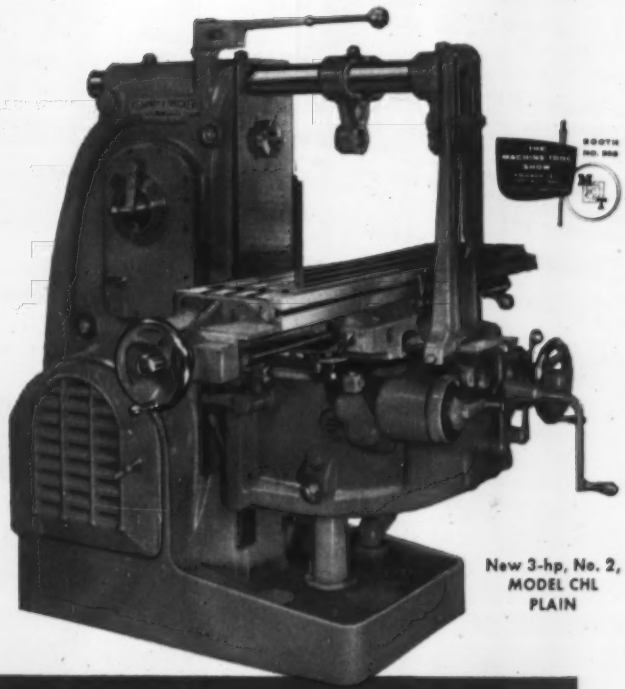
LESS THAN 23 CENTS PER HOUR

will put this new 3-hp, No. 2, Model CHL plain milling machine to work in your plant with

Kearney & Trecker's

TOOL-LEASE

PROGRAM



New 3-hp, No. 2, MODEL CHL PLAIN

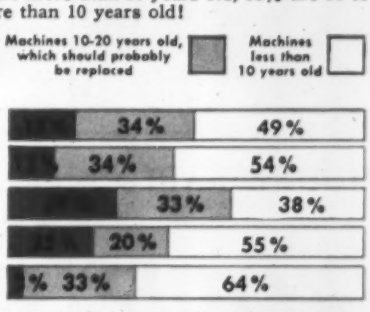
NO! We didn't make a mistake. Under Tool-Lease Plan "A", one of three seven-year lease agreements offered by Kearney & Trecker, you are asked to make two semi-annual rental payments, totaling 25% of the machine's price during each of the first three years. Actually, in dollars and cents, you are asked to invest approximately 23 cents per hour for a new 3-hp, No. 2, Model CHL plain milling machine. That means a machine installed in your plant and in operation — for pennies an hour!

What's more, under Tool-Lease, you can rent any of over 250 standard milling machines or precision boring machines. All are available under three basic plans, with varying options to continue or terminate the lease, or to purchase the equipment. If you require special machinery or heavy-duty CSM bed types, special agreements will be considered.

For complete information on Tool-Lease, see your Kearney & Trecker representative, or mail coupon to Kearney & Trecker Corp., 6784 W. National Avenue, Milwaukee 14, Wisconsin.

MACHINE TOOL OBSOLESCENCE IS BECOMING CRITICAL WHERE NO TOOL-LEASE

Here's the picture in a typical industry — GENERAL INDUSTRIAL EQUIPMENT — (see chart below). Of the 6032 standard knee type horizontal, vertical, bed and manufacturing type milling machines and precision boring machines in use today — which can be replaced by Tool-Lease equipment — 22% are more than 20 years old, 33% are 10 to 20 years old, 55% are more than 10 years old!



Figures adapted from 1953 American Machinist survey of metalworking industry

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KEARNEY & TRECKER
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EQUIPMENT
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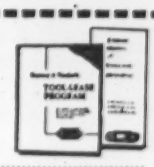
6784 W. National Ave., Milwaukee 14, Wis.

Please send me Tool-Lease Bulletin TL-10A and booklet titled "Critical Picture of Creeping Obsolescence," or call Milwaukee, GReenfield 6-8300.



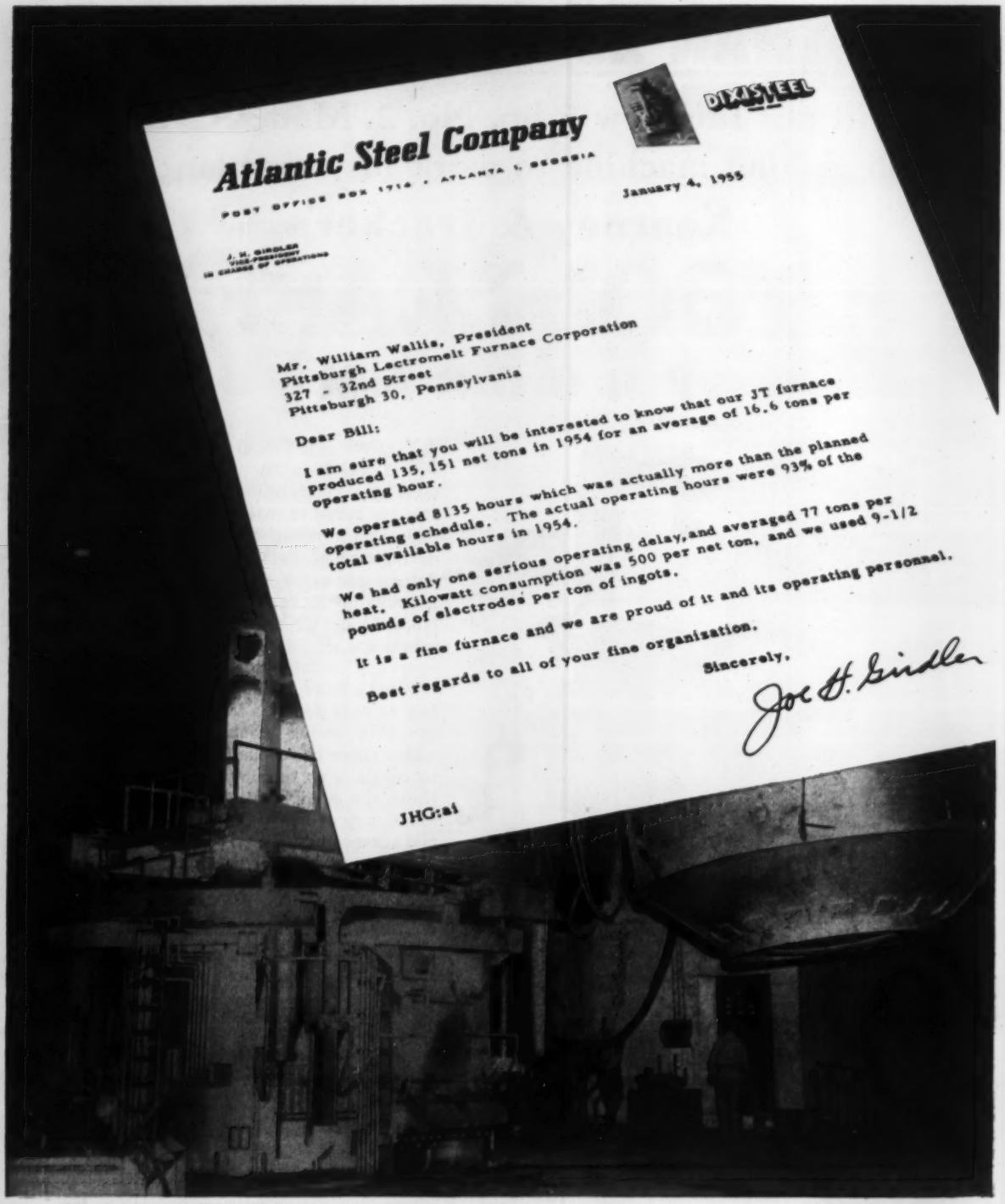
Name.....

Title.....

Company.....

Address.....

City..... Zone..... State.....


Atlantic Steel Company
POST OFFICE BOX 1716 • ATLANTA 1, GEORGIA
J. H. GINDLER
VICE-PRESIDENT
IN CHARGE OF OPERATIONS
DIXISTEEL
January 4, 1955
Mr. William Wallis, President
Pittsburgh Lectromelt Furnace Corporation
327 - 32nd Street
Pittsburgh 30, Pennsylvania
Dear Bill:
I am sure that you will be interested to know that our JT furnace produced 135,151 net tons in 1954 for an average of 16.6 tons per operating hour.
We operated 8135 hours which was actually more than the planned operating schedule. The actual operating hours were 93% of the total available hours in 1954.
We had only one serious operating delay, and averaged 77 tons per heat. Kilowatt consumption was 500 per net ton, and we used 9-1/2 pounds of electrodes per ton of ingots.
It is a fine furnace and we are proud of it and its operating personnel.
Best regards to all of your fine organization.
Sincerely,
Joe H. Gindler
JHG:ai

Manufactured in ... GERMANY: Friedrich Kocks GMBH, Dusseldorf ... ENGLAND: Birlec, Ltd., Birmingham ... FRANCE: Stein et Roubaix, Paris ... BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege ... SPAIN: General Electrica Espanola, Bilbao ... ITALY: Forni Stein, Genoa. JAPAN: Daido Steel Co., Ltd., Nagoya

*REG. T. M. U. S. PAT. OFF

MOORE RAPID

WHEN YOU MELT... *Lectromelt*

100-Year-Old Pioneer

Associated Spring continues to modify operations to meet needs of new industries

A $13-MILLION plant expansion and equipment modernization program carried out since the end of World War II has placed Associated Spring Corp. in an excellent position for continued growth in a highly competitive field, says C. F. Barnes, president. More than $4.5 million has been devoted to the three Bristol divisions (Wallace Barnes Co., Dunbar Bros. Co. and F. N. Manross & Sons). The firm's plant asset account has more than doubled since 1945. Its latest unit in process of installation is a Sendzimir mill which will almost double its capacity for the cold rolling of high-carbon strip steel.

Wide Product Range—The firm supplies precision mechanical springs and other metal components to almost every industry. Started nearly 100 years ago to make wire hoops for crinoline skirts and clock springs, Associated continually modifies its operations to meet new conditions. Its present wide range of springs includes those for guided missiles and atomic submarines.

Further diversification is in store for the Bristol divisions, says W. E. Froehlich, general manager. "In addition to the work which is being done . . . on components for guided missiles, we are looking into the consumer market," he added. "We are analyzing, designing and making products that are direct consumer items."

A tour of the firm's plants in Bristol and Forestville, Conn., reveals such operations as: Automatic coiling of compression and extension springs; high-speed automatic blanking presses, stamping out as many as 30,000 flat springs per hour; multiple-slide forming of intricately - shaped springs and snap rings; precision coiling of hairsprings for TV tuner coils; continuous cold-rolling of high-carbon steel; and coiling of starter springs. These springs are used for starters made by the Eclipse Machine Division of Bendix Aviation Corp. and are used on cars produced by Ford Motor Co., Dearborn, Mich., and Chrysler Corp., Detroit.

Koppers Buys Kuchler-Huhn

Koppers Co. Inc., Pittsburgh, purchased Kuchler-Huhn Co. Inc., Philadelphia, maker of mechanical seals for rotating shafts in jet engines, gas turbines and other high-speed, high-temperature equipment. The property will be operated as a department of Koppers Metal Products Division which has its headquarters in Baltimore.

Pipe and Tube Firm To Move

Stainless Welded Products Inc., Jersey City, N. J., will be operating from its new plant in Clifton, N. J., in September. Two new 380 and 550-ton mechanical presses will increase production capacity by 50 per cent. The firm makes pipe, tube and fittings.

Fabricator Broadens Activities

Continental Copper & Steel Industries Inc., New York, increased its activities in the field of steel, alloy and nonferrous metal fabricating with the expansion of its research and design department. Karl E. Fiebinger has been named director of the department. The firm's branches in the metal fabricating field include: Alloy Fabricators Division, Perth Amboy, N. J.; Walsh Holyoke Boiler Works with plants in Holyoke, Mass., and Portland, Me.; Welin Davit & Boat Division, Perth Amboy.

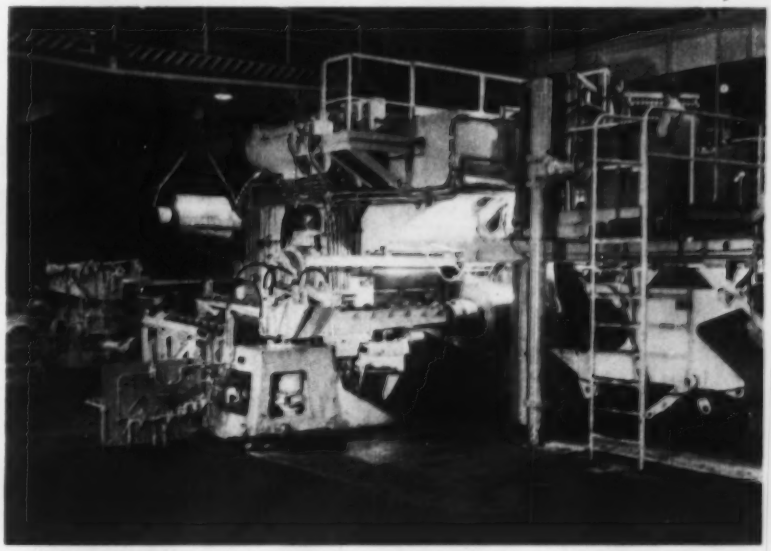
Canmakers Consolidate

National Can Corp., Chicago, will acquire Pacific Can Co., San Francisco, and will consolidate the two firms. National Can now operates 12 plants, manufacturing a wide variety of cans and metal fabricated houseware articles.

Bettinger Offers New Coatings

Norton Co., Worcester, Mass., granted the first license to Bettinger Corp., Waltham, Mass., for the application of Rokides, a new series of coatings. Bettinger, one of the leading companies in the production and application of high-temperature ceramic coatings, worked closely with Norton in formulating the series. The coatings permit metals to be used at temperatures ranging from 3000 to 3600° F. They can be used in industry for high-temperature

(*Please turn to page* 84)

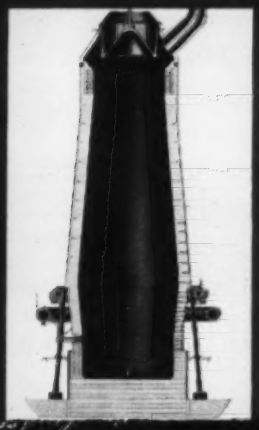


Aluminum Sheet Capacity Rises in Far West

Kaiser Aluminum & Chemical Corp., Oakland, Calif., installed this 60-in., 4-high cold-rolling mill at its sheet and plate mill at Trentwood, Wash. The 3000-fpm unit is the key facility in a $1.5-million expansion project at the plant. It increases Trentwood's light-gage aluminum sheet capacity by 36 million lb per year. Light-gage aluminum strip is shown being coiled in the center. Heavy-gage coil for rolling is seen being handled by a bridge crane in the left background

HARBISON-WALKER
AND SUBSIDIARIES

Harbison-Walker



BLAST FURNACE REFRACTORIES

specialized types
research-developed and service-proved
for every furnace requirement

The railroads were still pushing back the frontiers of America when Harbison-Walker manufactured its first blast furnace lining. During the years which have followed, the company has made the majority of all the blast furnace refractories used in the United States. Today there are more Harbison-Walker linings in service than all others.

The high standing of Harbison-Walker blast furnace refractories has been maintained through continuous product research and the continuous development of more precise methods of manufacture. Progress in blast furnace operation has demanded superior performance from refractories and Harbison-Walker refractories have kept abreast.

You are invited to consult Harbison-Walker regarding any of your refractories problems. The value of the company's recommendations is based upon its wide experience, its technical staff and its service records.

REFRACTORIES COMPANY

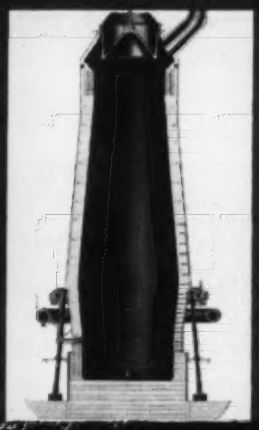
World's Largest Producer of Refractories • General Offices: Pittsburgh 22, Pennsylvania

HARBISON-WALKER
AND SUBSIDIARIES

(*Continued from page* 81)

operations and are expected to have their widest applications on rocket, missile and ram jet parts.

Bronze Products Buys Plant



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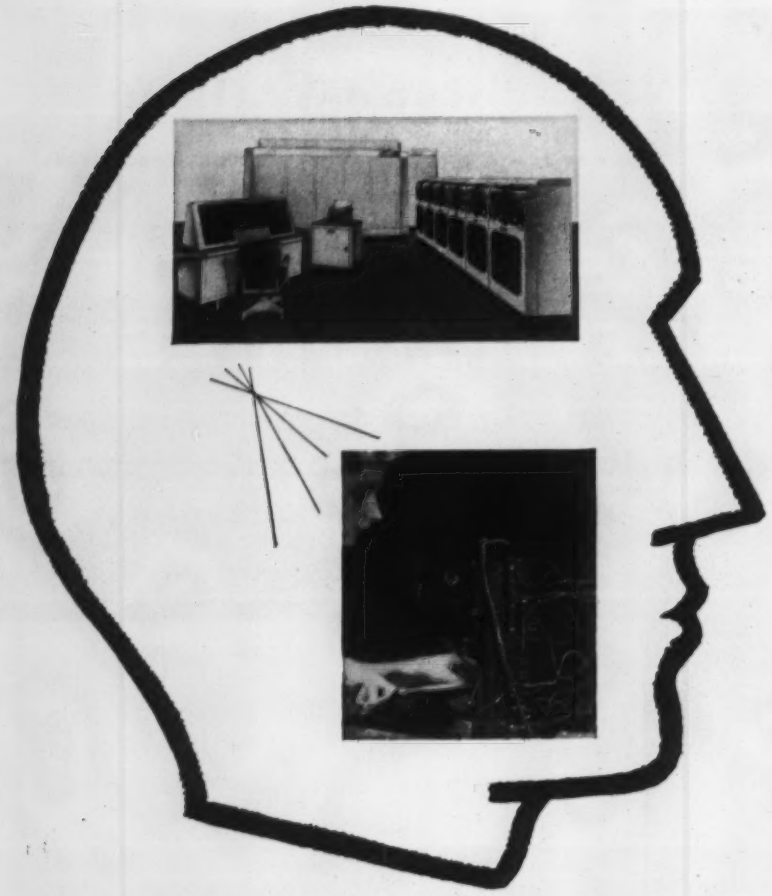
INLAND STEEL PRODUCTS COMPANY FINDS

Automatic SOLUTION FOR STORAGE PROBLEM



Metal ganglions for the mechanical brain

The nerve centers of modern electronic computers are the points of contact that permit the flow of electrical current from part to part. These points of contact must be firmly and permanently joined. Usually, delicate soldering operations are used for this purpose.

The electronics industry requires many tons of fine solders. The Federated Metals Division of American Smelting and Refining Company is a major producer of these solders.

Federated solders are the result of many years of research and development. Typical of advances made by Federated research are patented Castomatic bar and ingot solders. Made on automatic casting machines, controlled by electronic instruments, each bar or ingot is identical in size, shape and weight, with uniform composition unequalled by other methods of casting. Every bar gives the same results in the user's hand.

No matter what size, shape or composition you may need in a solder, think of Federated first as a source of supply. Our broad experience with all kinds of non-ferrous metals has earned us the name of Headquarters for Non-Ferrous Metals.

Federated Metals

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Federated first in the non-ferrous field AMD

Aluminum, Anodes, Babbitts, Brass, Bronze, Die Casting Metals, Lead, Lead Products, Magnesium, Solders, Type Metals, Zinc Dust

(*Continued from page* 81)

operations and are expected to have their widest applications on rocket, missile and ram jet parts.

Prenco Products Buys Plant

Prenco Products Inc., producer of a seal for impregnation of metal castings and weldments, purchased a plant at 507 E. Ten Mile Road, Hazel Park, Mich.

Johnson Bronze Expands

Johnson Bronze Co., New Castle, Pa., will erect a $550,000 addition to its plant to make bronze and brass bushings and bearings.

Republic Changes Plant Output

Republic Steel Corp. is switching its Niles Steel Products plant, Niles, O., from stampings to other Republic products, says S. C. McDowell, manager of the Pressed Steel Division. The change-over will take about nine months. Many stampings customers have installed their own equipment, causing a decline in the business, says Mr. McDowell.

Allis-Chalmers Regroups Units

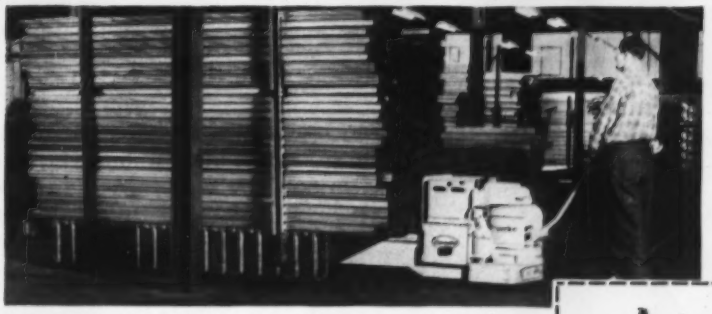
Allis-Chalmers Mfg. Co., Milwaukee, realigned its operating divisions, establishing six major ones. Three are in the industries group, formerly known as the General Machinery Division; three in the tractor group, formerly the Tractor Division.

J. L. Singleton, vice president, heads the industries group. J. W. McMullen is vice president and general manager of the Power Equipment Division. P. F. Bauer, manager of Allis-Chalmers' apparatus department and general manager of the firm's Norwood, O., Works, is general manager of the Industrial Equipment Division. Mr. Bauer also has two Canadian plants in his division. Heading the General Products Division is W. M. Wallace. R. M. Casper, previously manager of the General Machinery Division's power department, is administrative assistant to J. L. Singleton.

W. G. Scholl, vice president, heads the tractor group. Heading the Farm Equipment Division is

INLAND STEEL PRODUCTS COMPANY FINDS

Automatic SOLUTION FOR STORAGE PROBLEM



20% More Storage Space Using Automatic Trucks

Inland Steel Products Co. was up against it for storage space. The Milwaukee plant's odd-shaped products (gutters, downspouts, lath, heating fittings and other consumer products) could not be stacked, had to be stored on the floor. No storage space was available outside the plant, so Inland Steel Products Co. converted half its main-floor manufacturing area into a warehouse.

To squeeze out the most storage space, Inland Steel Products Co. investigated the highly maneuverable Automatic Transporters. Their ability to turn at right angles in 10-foot aisles—carrying 10-foot loads!—allowed Inland Steel Products Co. to make aisles narrower by a foot than first thought possible. Order-picking down narrow 4-foot passages, taking 90° turns on crowded loading platforms, Transporters helped Inland Steel Products Co. develop 20% more storage space ...when it *really* counted!

Automatic keyed-to-the-job equipment solves materials handling problems for *all* kinds of American business. Let us help you, too. Just ask your secretary to mail the coupon. No obligation.

Exclusive Earns-Its-Own-Way Plan makes it easy to Lease an Automatic or purchase your truck with modest down and liberal deferred-payment terms.

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All Quality Controlled
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WYCKOFF STEEL PRODUCTS — Carbon and Alloy Steels • Turned and Polished Shafting • Turned and Ground Shafting • Wide Flats up to 12" x 2"
All types of furnace treated Steels

L. W. Davis, formerly Pacific Coast territory manager for the Tractor Division. Boyd S. Oberlink is vice president and general manager of the Construction Machinery Division. R. K. Mangan continues as president and general manager of the Buda Division.

Buys Two Michigan Toolmakers

Madison Mfg. Co., Muskegon, Mich., and Madison Industries Inc., Big Rapids, Mich., were purchased by Flightex Fabrics Inc., Providence, R. I., and will be operated as wholly owned subsidiaries. The Michigan firms make boring and reaming tools, gun drills, trepanning tools, bore gages and grinding fixtures.

ASSOCIATIONS

New officers of the **Machinery Dealers National Association**, Washington, are: President, Benjamin Weiss; first vice president, R. D. Williams; second vice president, R. W. Rice; treasurer, A. D. Lucas; executive director, R. K. Vinson.

Charles W. Stewart Jr. was elected president of the **Machinery & Allied Products Institute**, Washington. He will also serve as chairman of the Council for Technological Advancement, an affiliate organization of the institute. Vice presidents of the institute are: R. W. Gillispie, Jeffrey Mfg. Co., Columbus, O.; Alfred Iddles, Babcock & Wilcox Co., New York; Morehead Patterson, American Machine & Foundry Co., New York; G. A. Wainwright, Diamond Chain Co. Inc., Indianapolis; T. H. West, Draper Corp., Hopedale, Mass. Treasurer is James D. Vaughan, Alco Products Inc., New York. Staff officers include Alexander Konkle, vice president; George Terborgh, research director; Charles I. Derr, secretary.

The American Management Association, New York, elected four divisional vice presidents. They are: Vice president in charge of the general management division, Alden G. Roach, president, Columbia-Geneva Steel Division, United

SEE US AT SPACE 1219

THE MACHINE TOOL SHOW
CHICAGO, ILL.
SEPT. 6-17, 1955
INTERNATIONAL AMPHITHEATRE

POTTER & JOHNSTON

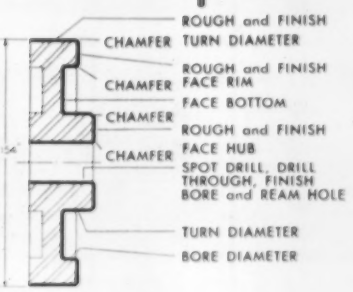
4-U AUTOMATIC TURRET LATHE

Handles TOUGH STEEL FORGINGS

Quickly . . . Economically

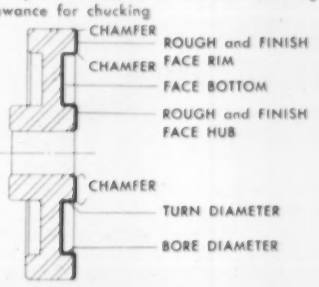
Jobs like machining this change gear blank, forged from 6150 steel, including boring the 1⅛" hole ***from the solid***, are easy, fast, profitable. That's because the P&J 4-U is a ***modern*** machine with the advanced design, added rigidity, and extra speed and power to take today's tough steels in stride.

WITH TOOLING ENGINEERED BY P & J EXPERTS



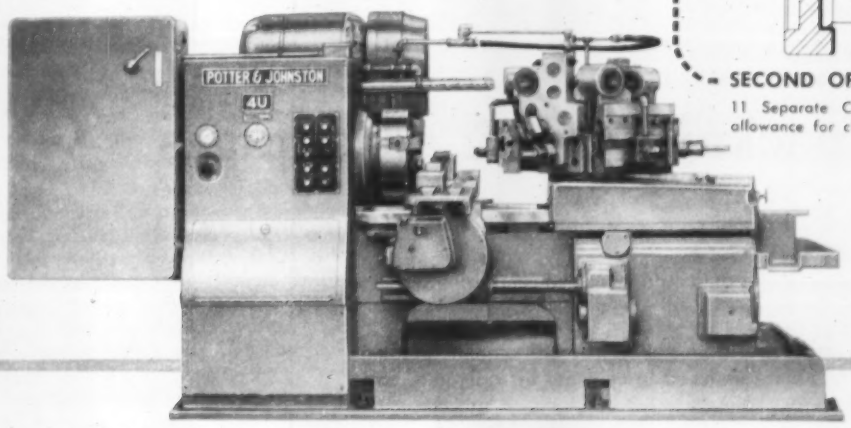
FIRST OPERATION

17 Separate Cuts, 3.41 minutes including allowance for chucking



SECOND OPERATION

11 Separate Cuts, 2.56 minutes including allowance for chucking



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To serve you best, all P&J Automatics are made available to you through Potter & Johnston and Pratt & Whitney direct-factory Representatives. For full information on the 4-U and other P&J Automatics . . . plus expert application engineering . . . phone or write the P&W Branch Office conveniently near you.

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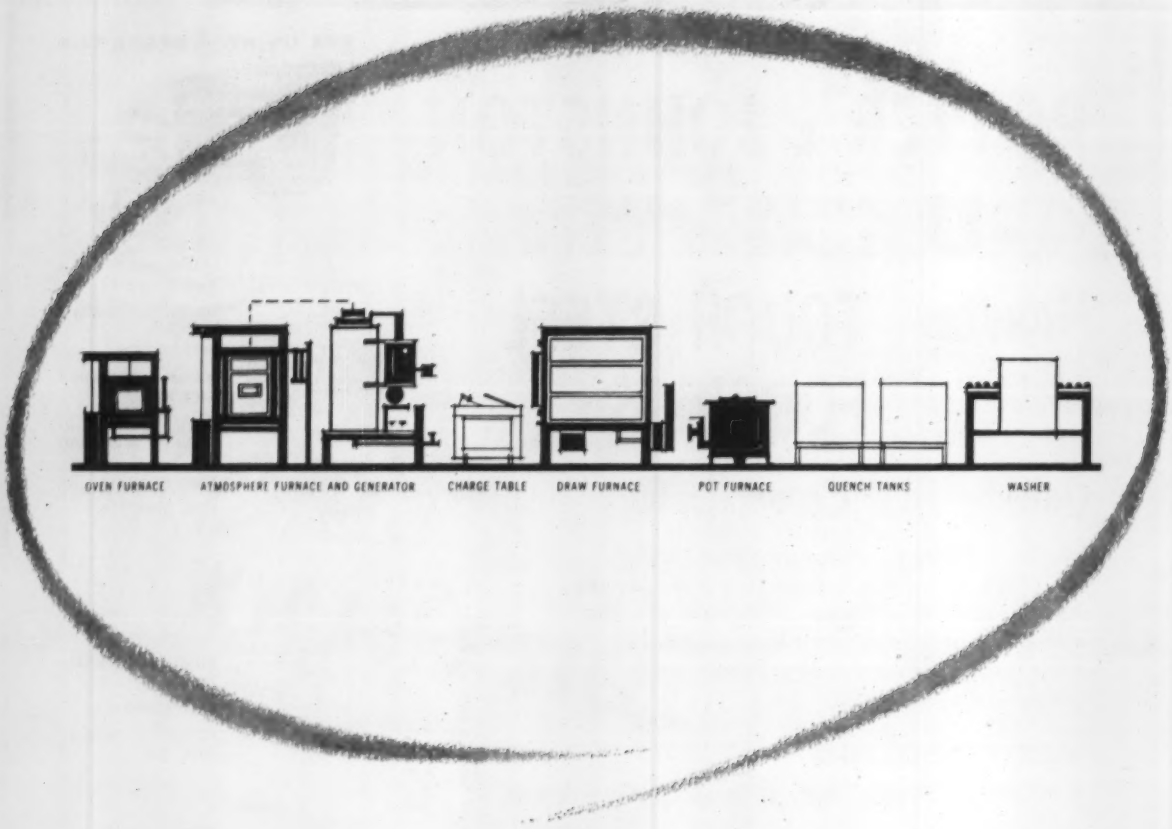
SAN FRANCISCO • ST. LOUIS • EXPORT DEPT., PAWTUCKET, RHODE ISLAND
AGENTS: DALLAS, THE STANCO CO. • HOUSTON, WESSENDORFF, NELMS & CO.

PRECISION PRODUCTION TOOLING P&J FOR MORE THAN FIFTY YEARS



one package: many advantages

buy a complete heat treat facility from a single source—as you can from Surface Combustion—and you save both time and trouble.

in one neat package, you get furnaces*, atmosphere generators, quench tanks, and washers. The individual units are matched in capacity for operating efficiency—and here's how you save:

you avoid juggling the delivery and installation schedules of different suppliers. You get one complete installation, scheduled to meet your requirements. Responsibility is clear and straight-line. You call one place for service.

combine these advantages with the operating superiorities of 'Surface' equipment, and you get a capital investment which yields healthy returns.

**At 'Surface,' you can choose from the biggest-in-the-industry line of standard furnaces for forging, annealing, hardening, drawing, solution heat treating, cyaniding, carburizing, normalizing, metal melting, or lab work.*

write for details on the package plan

Surface
HEAT TREATING EQUIPMENT

SURFACE COMBUSTION CORPORATION, TOLEDO 1, OHIO

MONEL•NICKEL•COPPER•ALLOYS
THIN STRIP

no standard
is too exacting

Temper requirements for the thin nickel strip (.002") used in sensitive electronic tubes were too exacting to be checked by the usual methods. So Somers carefully hand checks several samples from each lot by the ultra-precise "bend test" illustrated above.

Since 1910 Somers Brass Company has specialized in producing thin strip: nickel and its alloys below .020" and copper and its alloys below .012" with the tensile properties, fatigue resistance, drawing properties and many other requirements which only the most exacting standards of production and quality control can meet.

Whatever your specifications may be, why not take advantage of Somers long experience? Write for field engineer or Confidential Data Blank for a complete survey of your problem at no cost or obligation.

FOR EXACTING STANDARDS ONLY
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Somers Brass Company, Inc.
WATERBURY, CONN.

States Steel Corp., San Francisco; vice president in charge of the manufacturing division, R. K. Mueller, vice president, Plastics Division, Monsanto Chemical Co., Springfield, Mass.; vice president in charge of the marketing division, S. T. Harris, Texas Instruments Inc., Dallas; vice president in charge of the insurance division, R. L. Jacobus, manager, insurance department, Ford Motor Co., Dearborn, Mich.

REPRESENTATIVES

Briggs Shock Absorber Co., a division of Gabriel Co., Cleveland, appointed Charles E. Wanstall western field representative with headquarters in Tyler, Tex.

Seymour Mfg. Co., Seymour, Conn., appointed General Copper & Brass Co., Philadelphia, as a distributor, carrying sizable stocks of Seymour nickel-silver, phosphor bronze and brass.

Hydra-Feed Machine Tool Corp., Ferndale, Mich., maker of lathes, appointed Neff, Kohlbusch & Bissell Inc., Chicago, distributor.

NEW ADDRESSES

Hunt Screw & Mfg. Co. moved to 4117 N. Kilpatrick Ave., Chicago 41, Ill.

Barber-Colman Co.'s Wheelco Instruments Division, Rockford, Ill., moved its Chicago office to 6610 N. Sheridan Road.

Vlier Engineering Inc., manufacturer of tooling accessories, moved into a building at 8900 Santa Monica Blvd., Los Angeles 46, Calif.

Worthington Corp., Harrison, N. J., moved its Midwest regional engineering and service division to 6124 N. Pulaski Road, Chicago. The expanded operation is under the direction of L. R. Dise, manager. The Chicago district sales office (W. C. Cheek, manager), continues at 400 W. Madison St., Chicago 6, Ill.

Somers
UNIGRAIN®
thin strip brass
for
deep drawing

Uniform fine grain size of Somers eyelet brass—less than .010 mm. (75X).

with
Fine Grain Finish

Somers Brass Company is pleased to announce the availability of a new, unique annealing process which makes possible a uniform fine grain of less than .010 mm. which can be drawn to full 40% elongation.

Developed in cooperation with the Selas Corp. of America this new process makes it possible to deep draw Somers THIN STRIP and still obtain a fine grain which is easily buffed to a brilliant finish.

And this new Selas Furnace provides high production as well as close control of temper and uniformity. It is typical of the modern equipment with which Somers produces copper, brass and other alloys to rigid specifications between .010" and .00075".

If you have a problem with thin strip, let Somers experience help you. Write for confidential data blank or field engineer.

FOR EXACTING STANDARDS ONLY
MONEL•NICKEL•COPPER•ALLOYS
THIN STRIP

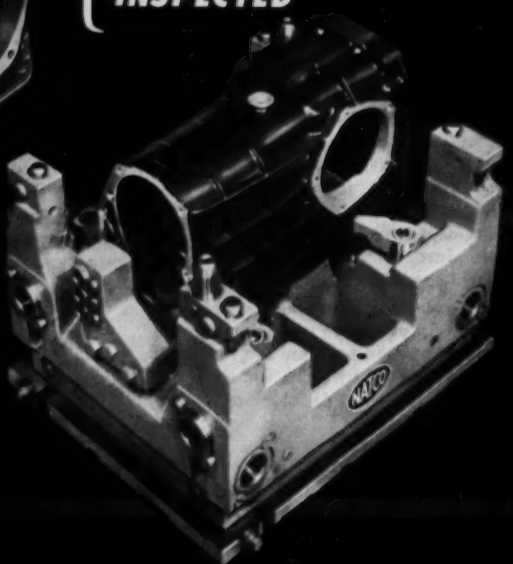
Somers Brass Company, Inc.
WATERBURY, CONN.

MORE TRANSMISSION CASES AT LESS COST.....

55 PARTS per HOUR

201 OPERATIONS ON EACH PART

DRILLED, BORED, REAMED, TAPPED, SPOTFACED, CROSS-FACED, MILLED, CHAMFERED and INSPECTED



Parts are loaded into individual holding units which are conveyed through the machine automatically. After machining is completed, chips are removed and the holding units pass through a washer and are returned to the first station.

for answers to your Drilling, Boring, Facing and Tapping problems

Call a Natco Field Engineer

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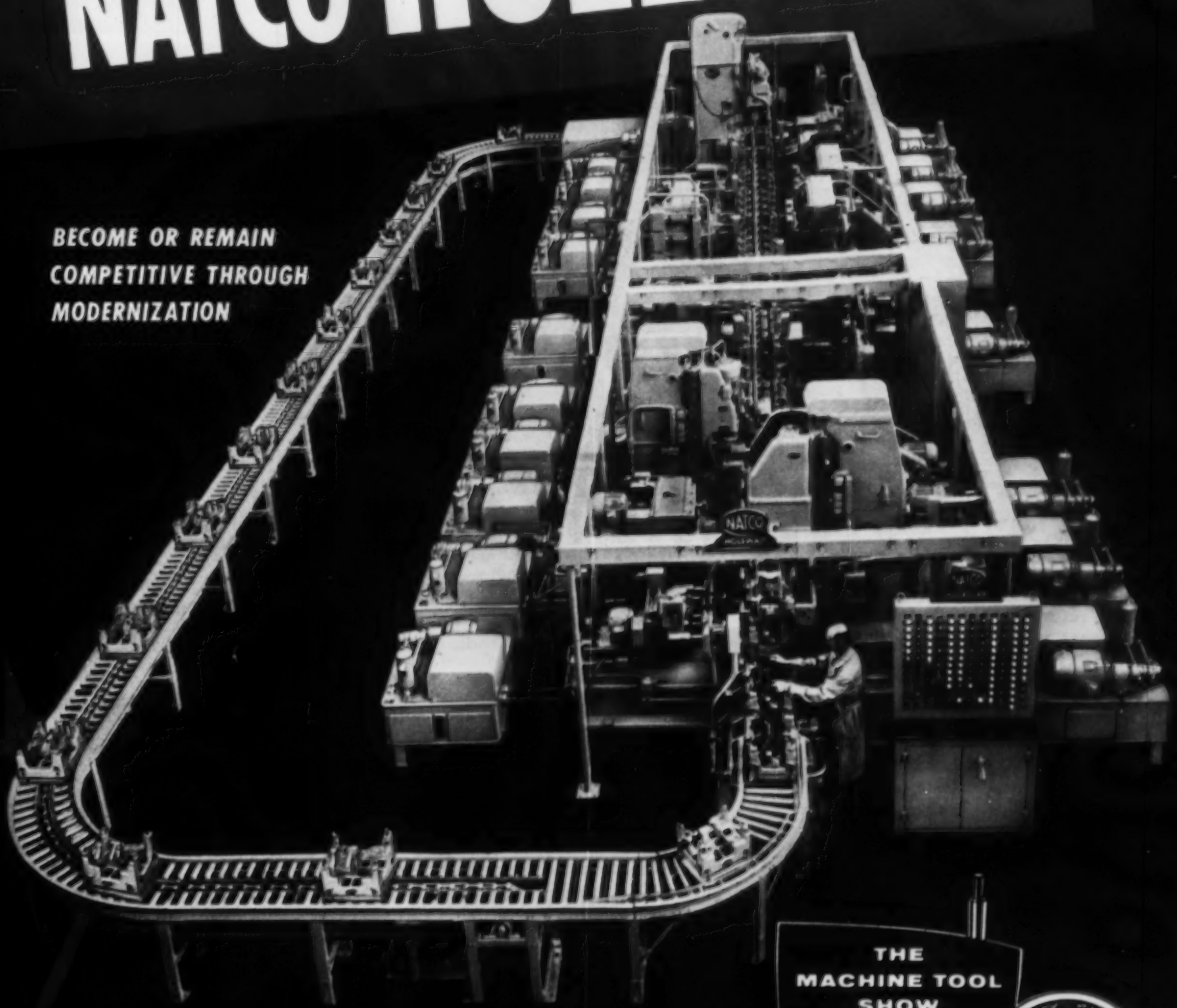
DETROIT, *10138 W. McNichols Rd.*
BUFFALO, *1807 Elmwood Ave.*
NEW YORK, *35 Beechwood Ave., Mount Vernon*

..... WITH A NEW NATCO HOLEWAY

BECOME OR REMAIN COMPETITIVE THROUGH MODERNIZATION



THE MACHINE TOOL SHOW
CHICAGO, ILL.
SEPT. 6-17, 1955
INTERNATIONAL AMPHITHEATRE

...Competitize with NATCO production!

NATIONAL AUTOMATIC TOOL COMPANY, INC.

RICHMOND, INDIANA

NATCO

How to Bag a Tea

. . . and knock the stuffing out of packaging costs

Here's an old familiar package that one tea importer thought cost too much to make. So he made plans for a completely new automatic tea-bagging machine. And took them to Taft-Peirce.

Taft-Peirce engineers built a working model to his specifications. An amazing affair that fills a tea bag, attaches string and tag, staples the bag shut, and places it in a paper envelope — all in *one* operation. Today, this machine is *increasing* production and *lowering* unit costs. Savings in labor alone paid for it in short order.

Perhaps you have a problem that Taft-Peirce creative manufacturing skills can solve. For a more complete picture of our facilities and experience, send for 92-page illustrated booklet, "Take It To Taft-Peirce."

We'll Design It . . . Some typical design assists by T-P engineers — a silent typewriter, automobile engine, automatic lens grinders, countless machine-tools and smaller mechanisms.

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Ship It . . . Taft-Peirce offers you all or any part of these services.

For Engineering, Tooling, Contract Manufacturing

TAKE IT TO TAFT-PEIRCE

The Taft-Peirce Manufacturing Company, Woonsocket, R.I.

TELEPHONE: WOONSOCKET 1

6

STEEL's 1955 Management Series . . .

The editors of STEEL herewith present the sixth in their ten-part series, Program for Management for 1955. The complete list:

1. **Product Communication** (Feb. 14, p. 73)
2. **Cut Costs To Preserve Profits** (Mar. 14, p. 93)
3. **Better Plant Layout** (Apr. 18, p. 93)
4. **Business Communication** (May 16, p. 103)
5. **When To Re-equip** (June 20, p. 99)
6. **Put Business Trends To Work** (July 18, p. 93)
7. **Consultants** (Aug. 15)
8. **Purchase Analysis** (Sept. 19)
9. **Market Facts** (Oct. 17)
10. **Keep Your Product Growing** (Nov. 14)

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department, STEEL, Penton Bldg., Cleveland 13, O.*

BUSINESS TRENDS:

Put Them to Work

"AND COMING EVENTS cast their shadows before."

You can add a great deal of certainty to your business planning by heeding that century-old advice—perhaps even get the jump on your competition. Although a wealth of "shadow-casting" business facts is available to all, their wise counsel is not always followed.

Example—The manufacturers of fabricated metal products were buying steel "like crazy" in the first half of 1953. Some were paying premium prices.

The "shadows" foretold a different story. But fabricators either didn't pay attention or didn't know where to look.

All they had to do was refer to pages S-3 and S-4 of the May, 1953, number of the *Survey of Current Business,* issued by the U. S. Department of Commerce. They warned: Inventories were climbing to a peak. New orders were sliding. This called for a readjustment in buying—the reverse of what was happening.

Humpty Dumpty—As a result of the buying spree, steel production declined from 100 per cent of capacity at the end of June, 1953, to 95 per cent for the next four months. In November, it really dipped. Consumers had stashed away so much steel that mills operated at only 60 to 70 per cent of capacity until October, 1954!

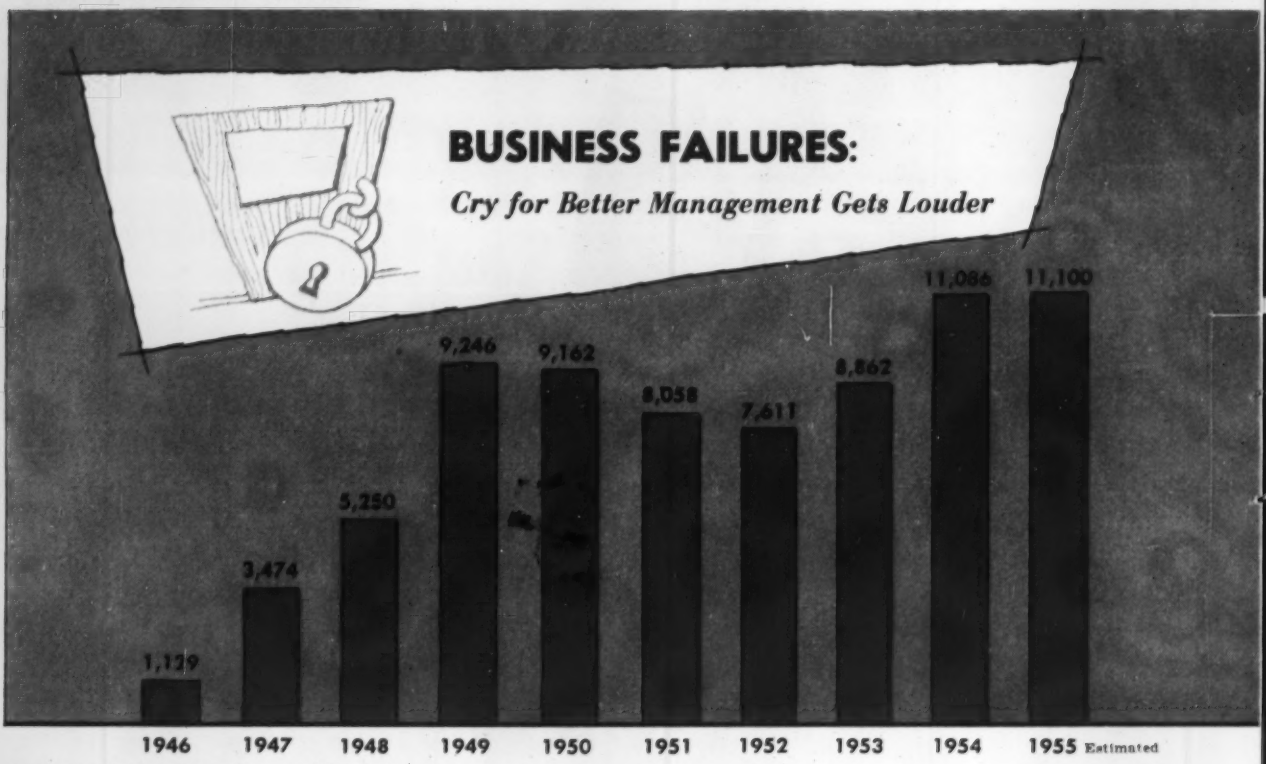
Business slumped. Big inventories meant that premium prices paid were down the drain. Money that could have been working was tied up in unneeded materials.

Point: Business is a gamble, but you don't have to play long shots. Dun & Bradstreet Inc. has the right idea. Its slogan is: "Make every risk a calculated risk!"

Case in Point—Alco Products Inc., known until April of this year as American Locomotive Co., incorporated in 1901 to acquire the property and business of eight producers of locomotives.

American Locomotive consistently was a leader. But in the 1920s the number of locomotives in service began to dwindle and continued to do so—since World War II, the drop has amounted to 25 per cent.

As the "shadows" got longer, American Locomotive started look-



Source: Dun & Bradstreet Inc. 1955 estimated by STEEL

ing around for more promising fields. Now, in addition to locomotives, the company makes three dozen products for a dozen markets. In 1945, only 25 per cent of its sales dollars came from products other than locomotives. By 1954 this figure grew to 75 per cent. (These comparisons do not include sales of combat tanks.)

Payoff—Says Alco's president, Perry T. Egbert: "We are well embarked on a program which can offer us greater security of earnings than we have ever known in the past when we were a specialty company."

Who Should Use Trends

Everyone who makes recommendations or decisions should use statistics as a tool.

It means that recommendations and decisions should be based on facts, not guesses or hunches.

When To Use Trends

Some of the areas in which business statistics should be used as tools in making decisions are:

1. Sales and pricing.
2. Purchasing.
3. Production.
4. Inventory accumulation or reduction.
5. Employment, wages and salaries.
6. Product mix.
7. Product diversification.
8. Plant expansion and location.
9. Re-equipment.
10. Advertising programs.
11. Financial policy (liquidity, debt).

Who Will Ferret Out Trends

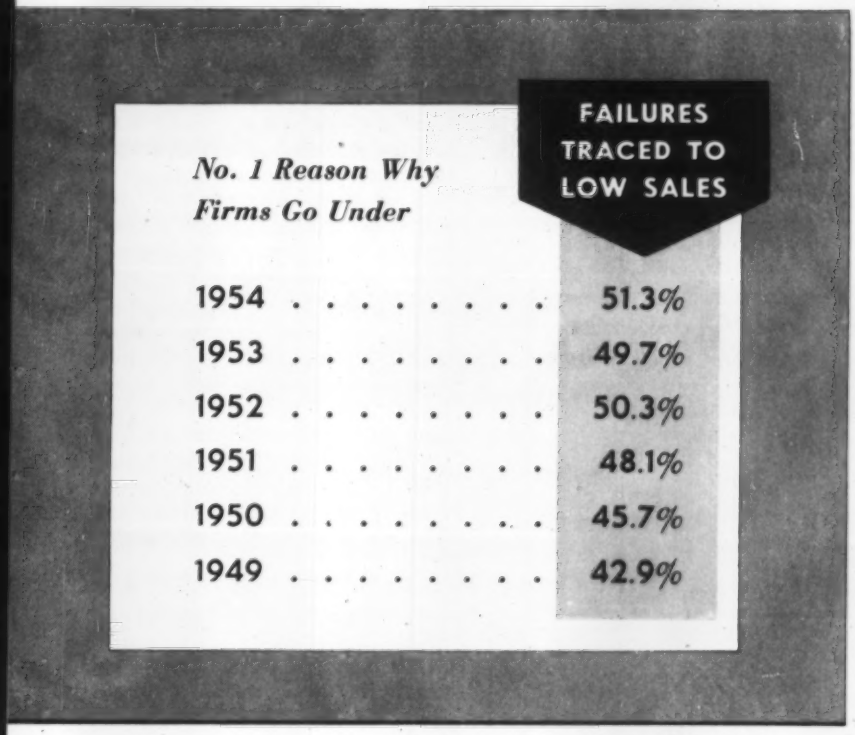
There are four main ways to get "shadow-casting" information.

1. Dig it out yourself.
2. Your company may have people specializing in research and forecasting.
3. You can employ an analyst or consultant.
4. You can use any combination of the preceding.

If you rely on your own people, here's a warning—particularly if you ask them to make forecasts: A person who can develop valid economic forecasts usually is quite different in temperament from a person who makes a good salesman or production man. The forecaster must be immune to persuasion. He must be unmoved by mass opinion, but he must recognize mass opinion and allow for it in arriving at his prediction.

Be Critical — Be wary of the forecast surrounded with hedges—unless, as discussed later, the matter can't be pinpointed. If a forecaster says sales of electric motors next year will be the same as this year's, plus or minus 10 per cent, he's giving himself 20 percentage points of protection. With that much leeway, he isn't too confident. You probably could come closer by guessing.

Flexibility is another matter. A forecaster should stand ready to make adjustments, so your planning can be based on the best and most up-to-date estimate of the future. Indecision is the extreme to be avoided. A forecaster who



wants to make changes all the time probably is reflecting the whims of his bosses and other businessmen.

What Trends To Use

The answer here depends on what business you are in and the decisions to be made.

The chief reason for watching trends is to make your business successful. But you can't confine business watching to your own company. It is affected by the trends of the industry of which it is a part. Both are affected by business as a whole. Keep an eye on:

1. Business as a whole.
2. Your industry.
3. Your company.

Getting a feel of business as a whole is the easiest. Through the year there are appraisals of the outlook for general business, especially at midyear and the turn of the year.

Helping Hands—Forecasts made by recognized economists and businessmen can be a valuable tool. Use them: 1. To save you the trouble of digging out the needed figures and appraising them. 2. To check against your thinking.

Many businessmen do some of their own watching of general business. They have their favorite signals, or barometers. A survey among marketing executives was made by *Tide*, the magazine of sales and advertising trends. Published on May 21, 1955, it shows that 36 per cent think steel production is the best weathervane; 15 per cent watch automobile output; 15 per cent prefer home construction; 12 per cent choose industrial construction; 9 per cent watch the stock market; 5 per cent list appliance sales; 4 per cent follow sales of soft goods; 3 per cent watch industrial equipment sales; and the rest think you have to keep an eye on more than one barometer.

Perspective—The search for reliable barometers has been going on a long time. Experience reveals some are not prophetic; they merely reflect current happenings.

This does not mean that the use of barometers is unwise. Find out which are the best and use several, rather than just one. The same caution must be practiced in interpreting what barometers have to say.

A decline in one or more indicators can't be construed immediately as the onset of a recession. Likewise, an upward turn can't definitely be called the beginning of a boom. Fluctuations come within a major trend just like the temperatures vary from day to day during the summer. A 20-degree drop doesn't necessarily herald the coming of fall or winter.

But business isn't quite so predictable as the seasons. If you watch important signals, you'll keep on guard against substantial changes that could cost you money. If you are caught unawares, you might not have your sales program geared for an expanding demand, or your inventories might be too heavy for riding out a recession.

What are the best barometers? The National Bureau of Economic Research, New York, examined hundreds. The results were published in "Statistical Indicators of Cyclical Revivals and Recessions," by Geoffrey H. Moore in the bureau's Occasional Paper 31.

Watch the Leaders—The report shows how 21 well known barometers stack up. Eight were found to move in advance of a change in general business; eight move at about the time business as a whole changes; five lag behind changes in general business (see tables, pages 98 and 99).

In using barometers, there are some things you'll have to take into account: 1. Monthly statistics are not up to date. It's a good idea to use available weekly or daily figures. 2. Seasonal variations must be allowed for. (A drop in natural gas sales to residential consumers in April is not alarming; it's to be expected—the heating season is waning then.) 3. There's no guarantee that the lead or lag of a barometer always will coincide with the average.

After you feel you have a pretty good idea of what business in gen-

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THE first two publications answer many statistical questions. The subscription to the *Survey of Current Business* should be renewed each year. A new copy of the *Statistical Abstract* is needed only every two or three years.

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Survey of Current Business (Includes a weekly statistical supplement) Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.	$3.25 a year (Issued monthly)
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Economic Indicators Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.	$2.00 a year (Issued monthly)
Monthly Labor Review Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.	$6.25 a year (Issued monthly)
Federal Reserve Bulletin Board of Governors, the Federal Reserve System, Washington 25, D.C.	$2.00 a year (Issued monthly)

Source: Committee on Business Statistics, Chamber of Commerce of the United States.

eral will do, you'll want to estimate how your own business will fare.

Examine Your Industry—Apart from the ups and downs of business as a whole, individual industries have their own fluctuations. You can learn their patterns from statistics supplied by the federal government, from trade associations and industrial publications.

When you arrive at a good estimate for your industry's business, you are ready to see how your own business is likely to do. Don't forget that the individual company has conditions peculiar to itself—such as competition, price policies, type of products, inventory policies, plant location and methods of production and distribution.

Figures from your own company will help you in gaging its future.

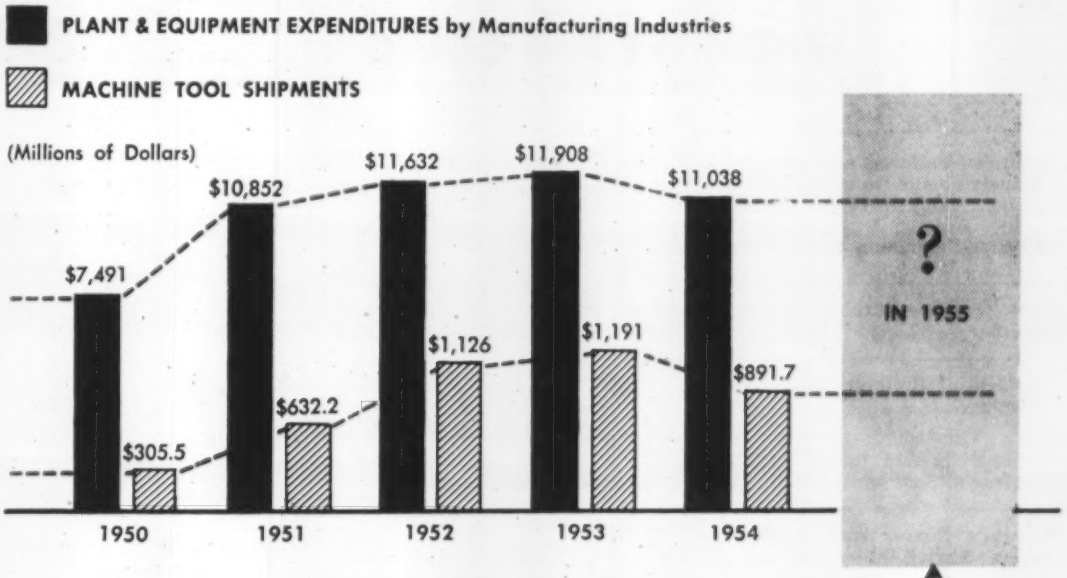
Whether you are making an estimate of business as a whole, your industry or your company, the figures you gather are not a substitute for good judgment. You supply that. The figures are merely tools to help you.

Short Vs. Long Term

Most decisions you'll make will be for the short term, but, occasionally, you'll have to make some for the long term.

It generally is easier to size up the next six months than the following 6 or 12, simply because the first six months depend to a great extent on what's happening today. For instance, new orders received now by manufacturers will be turned into production within the next six months. If new orders are rising, they indicate a rise in production in the next six months. If new orders are declining, a contraction in production can be expected in the next six months.

Easier To Look Far—You may find that a ten-year projection is easier to make than one for the next two years. In the ten-year forecast you can be more general, and you'll probably base the long-range estimate on a fairly-well-established assumed rate of growth. The medium-term projection puts you on middle ground. You can't project it directly out of today's



How To Put a Business Trend to Work

Problem: To get an estimate of machine tool shipments in 1955.

An Approach: Compare plant and equipment expenditures for manufacturing industries and machine tool shipments.

Finding: Machine tool shipments closely parallel plant and equipment expenditures of manufacturing industries.

With plant and equipment expenditures by manufacturing industries estimated at $10,704 million in 1955, shipments of machine tools should be about $865 million. (In the first five months, they were $265.8 million, compared with $456.2 million in the like period of 1954.)

Source of Statistics: Plant and equipment expenditures—*Survey of Current Business.* Machine tool shipments—Monthly reports of National Machine Tool Builders' Association.

happenings, yet it is not long-range enough to allow you the freedom of generalities.

Short-term forecasts (monthly, quarterly, semiannually, or annually) are a guide in current operations. They are the basis for decisions on production, inventories, pricing and setting sales goals.

Long-term projections may deal with capital budgets, long-range financing programs, targets for long-term changes in sales development programs, location of new facilities and product diversification.

Word of Warning—Short-term projections shouldn't overestimate growth factors. Unless an industry is in a period of extraordinary growth, current demand factors usually outweigh growth factors. Population growth is recognized as an important factor in expansion of steel demand. The population was growing at the beginning of 1954, but that didn't prevent a drop in steel demand that year. It is in long-range projections that growth factors take on paramount importance.

In accepting forecasts from others or in making them yourself, watch for overoptimism and overpessimism. Sometimes the in-

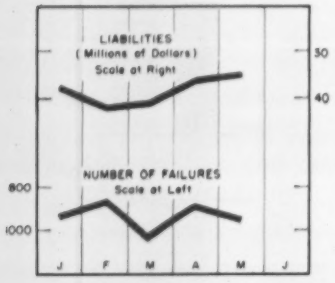
These Barometers Can Best Indicate

WHERE WE ARE GOING

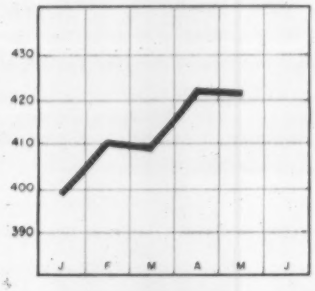
BAROMETER	SOURCE	HOW FAR THEY PRECEDE A PEAK IN GENERAL BUSINESS — Avg. No. Months	HOW FAR THEY PRECEDE A TROUGH IN GENERAL BUSINESS — Avg. No. Months
1. **Business Failures and Liabilities** (industrial and commercial)—inverted	Dun & Bradstreet Inc.	10.5	7.5
2. **Industrial Common Stock Price Index**	Dow-Jones & Co. Inc.	6.0	7.2
3. **New Orders—Durable Goods Industries,** value	U. S. Department of Commerce	6.9	4.7
4. **Residential Building Contracts,** floor area	F. W. Dodge Corp.	6.2	4.5
5. **Commercial and Industrial Building Contracts,** floor area	F. W. Dodge Corp.	5.2	1.7
6. **Average Hours Worked per Week,** manufacturing industries	U. S. Bureau of Labor Statistics	3.8	2.6
7. **New Incorporations,** number	Dun & Bradstreet Inc.	2.5	3.5
8. **Wholesale Price Index,** 28 basic commodities	U. S. Bureau of Labor Statistics	2.6	3.2

Source: Occasional Paper 31 ("Statistical Indicators of Cyclical Revivals and Recessions") by Geoffrey H. Moore, published by National Bureau of Economic Research.

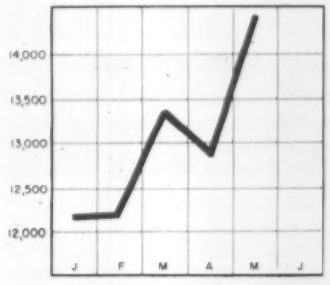
Business Failures and Liabilities
(Industrial and commercial—Inverted)



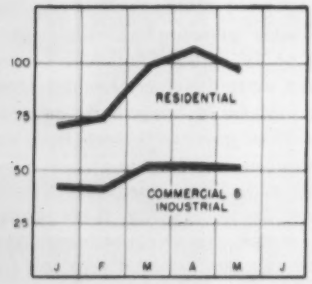
Industrial Common Stock Price Index
(Dollars per share)



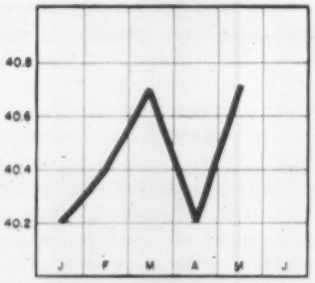
New Orders for Durable Goods
(Millions of dollars—Adjusted for seasonal variation)



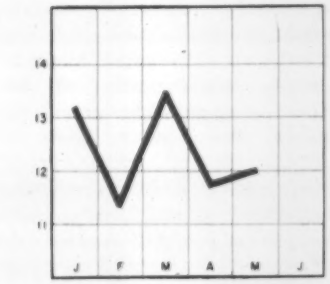
Building Contracts Awarded
(Millions of sq. ft. of floor area)



Hours Worked Per Week
(Average in manufacturing industries)



New Business Incorporations
(Thousands)



These Indicators Tell You Merely WHERE WE ARE

BAROMETER	SOURCE	HOW FAR THEY PRECEDE A PEAK IN GENERAL BUSINESS Avg. No. Months	HOW FAR THEY PRECEDE A TROUGH IN GENERAL BUSINESS Avg. No. Months
1. **Employment,** nonagricultural	U. S. Bureau of Labor Statistics	0.2	3.3
2. **Unemployment**—inverted	U. S. Department of Commerce	—	—
3. **Corporate Profits,** quarterly	U. S. Department of Commerce	1.5	1.8
4. **Bank Debits Outside New York City**	Federal Reserve Board	2.0†	4.3
5. **Freight Car Loadings**	Association of American Railroads	0.3	1.3
6. **Industrial Production Index**	Federal Reserve Board	0.6†	2.2
7. **Gross National Product,** quarterly	U. S. Department of Commerce	—	—
8. **Wholesale Price Index,** excluding farm products and foods	U. S. Bureau of Labor Statistics	3.5	3.7†

These Indicators Tell You Only WHERE WE HAVE BEEN

		HOW FAR THEY LAG BEHIND A PEAK IN GENERAL BUSINESS	HOW FAR THEY LAG BEHIND A TROUGH IN GENERAL BUSINESS
1. **Personal Income**	U. S. Department of Commerce	4.0	0.2‡
2. **Sales by Retail Stores**	U. S. Department of Commerce	3.8	1.8
3. **Consumer Installment Debt**	Federal Reserve Board	5.0	3.5
4. **Bank Rates on Business Loans,** quarterly	Federal Reserve Board	5.5	4.8
5. **Manufacturers' Inventories,** in current prices	U. S. Department of Commerce	6.5	7.5

† Lags. ‡ Leads.

Source: Occasional Paper 31 ("Statistical Indicators of Cyclical Revivals and Recessions") by Geoffrey H. Moore, published by National Bureau of Economic Research.

dividual is so impressed with what's going on today that he loses some of his sense of balance in his forward thinking.

Of all the forecasts used by industry, the sales forecast probably is the most important. Practically all affairs of a company depend upon sales.

Sources of Trends

Where do you go to find figures on trends? There are two general sources: 1. Internal. 2. External.

Internal sources are records of your company's business. It isn't wise to stop here. Your company's records will tell you only how your company is doing. They don't provide you with comparisons to show how well you should be doing. Your records may show your company's sales are increasing each year. But are they increasing as fast as those of your industry? Maybe your company is not keeping up with the pack!

Look Outside—This is the point where you should look to external sources for data. Such information will give you something to compare your own company's figures with. You may even need or want to go so far as to compare your company's figures or your industry's figures with gages of business as a whole, such as the Federal Reserve Board's industrial production index or the gross national product.

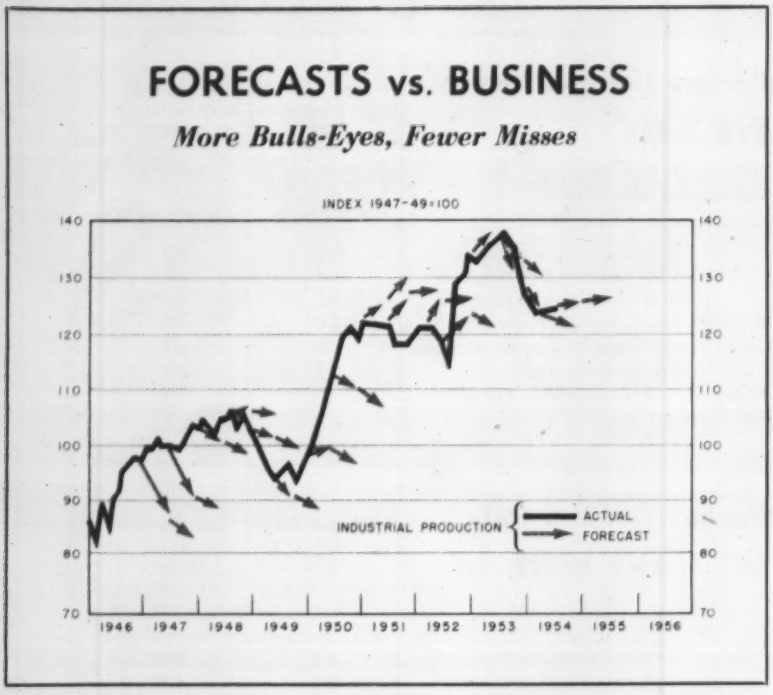
The list of sources is lengthy. Many figures are issued by agencies of the federal or state governments. Other important fonts of information are trade and professional associations, institutes and industrial publications.

Build a Library—You can make these external sources available internally by building your own library. If you must limit its size to a few basic books of statistics, you may find it helpful to look to your public library for supplementary data. Libraries in most large cities have business information departments.

Any of the 33 field offices of the U. S. Department of Commerce will help you, too. They have a great many government reports on hand.

Poll the People—Other external sources of data are customers, salesmen and distributors. From customers you often can find out their buying intentions. This is good, for it is looking forward. You can conduct your own survey among them, or you can turn to consumer surveys made by others, such as the annual survey on consumer expectations, which is published by the Federal Reserve System. It aims to show whether consumers think the time is good to buy things like automobiles, houses and other consumer durable goods.

The Securities & Exchange Commission and the U. S. Department of Commerce regularly poll



Source: J. A. Livingston and Business and Economic Forecasting, by Chamber of Commerce of the United States.

a broad cross section of companies to learn their plans for plant and equipment investment.

The National Association of Purchasing Agents, New York, makes public once a month the business outlook as seen by purchasing agents. They are in an especially sensitive position to watch product availability and price trends.

Watch the Magazines — Industrial publications make surveys (quarterly, semiannually, annually) to see what people in their field expect or plan to do.

Another means of getting estimates from the outside is to ask your salesmen to estimate their sales (line by line or product by product) in their territories for the next 6 or 12 months. Salesmen reflect the customer's view.

How Reliable Are Forecasts?

Since 1952, the batting average of reputable forecasters has improved (see chart). But certain allowances must be made.

Sometimes forecasts are their own undoing. If it is widely distributed and believed, it may set contrary or confirmatory reactions into motion. A statement that the stock market will change sharply in three months might bring the reaction promptly. The prediction of an immediate change might generate a confirmatory reaction. The reaction might stem from a great many individuals or the government. The reactions might be in the form of governmental or business policies to forestall or to adjust to predicted developments.

Variable—The apple cart is upset because human beings are involved. You can't predict the alchemy of human behavior.

Of course, some responses can be anticipated. If the government becomes convinced that markets are softening and reluctance to spend is developing, it will loosen its strings on credit and increase the supply of money. If inflation is ballooning, the government will tighten its credit controls.

But the expected doesn't always happen. Business reactions may upset forecasts. If a decline in business is predicted, companies may be spurred into remedial action. Say they strengthen their sales efforts. If enough companies do this, the predicted decline may not come off, or at least it may not be so severe as expected.

Maybe It Was Right—For these reasons, says the Committee on Economic Policy of the Chamber of Commerce of the United States, forecasts may be intelligent, shrewd, foresighted and as nearly accurate as possible, and turn out to be wrong. "Thus, who can say that a forecast which ultimately misses its mark was wrong at the time it was made?"

An economist or agency making a projection should not carelessly be accused of a poor job. One purpose of forecasts is to set forth the nature and scope of adjustments that appear necessary to reach certain objectives. They also suggest the implications for the economy if the adjustments are not forthcoming.

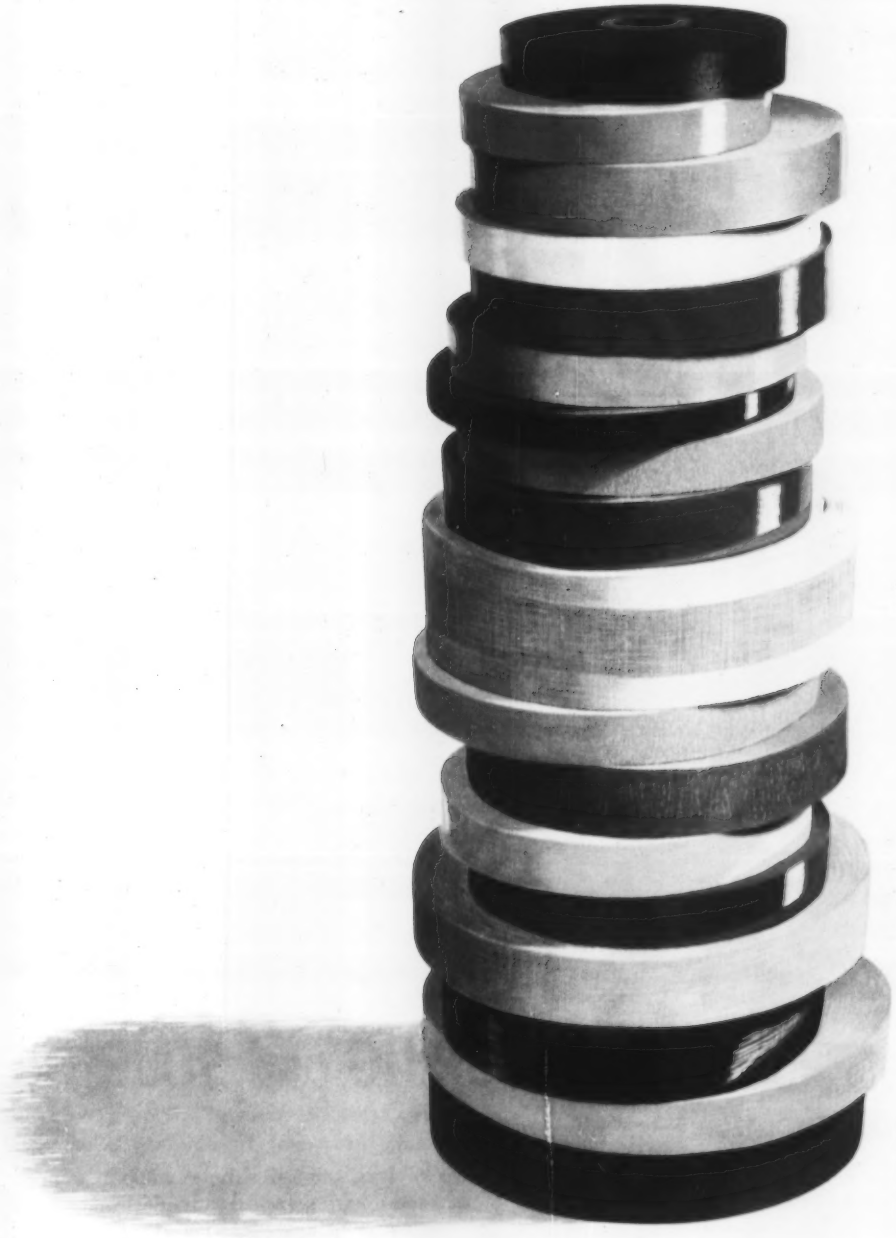
The forecaster's job does not necessarily include a prediction as to whether these adjustments will be made.

Getting Better — Although we do not have reliable scientific forecasting, analysis of expectations and other techniques are being improved to the point where they can be used to gage the future course of economic activity with surprising accuracy, says the National Bureau of Economic Research.

Maybe forecasts made by others aren't always right; maybe yours won't always be right, but that doesn't free you from the need to look ahead. When you try to find out what the future holds, you are exercising judgment. And a man's judgment is no better than his information.

You can remind yourself of the dangers of flying blind every time you sit down to breakfast. Some years ago a small manufacturer was thinking about making dinette tables with porcelain enamel tops. He knew the market was large, but he failed to check sales trends. Laminated plastic tops were outselling porcelain tops. With a shrinking market, there was dog-eat-dog competition among makers of the porcelain product. The improvident newcomer almost lost his shirt.

He could have avoided a lot of grief had he remembered "coming events cast their shadows before." You can, too.



whatever the job . . .

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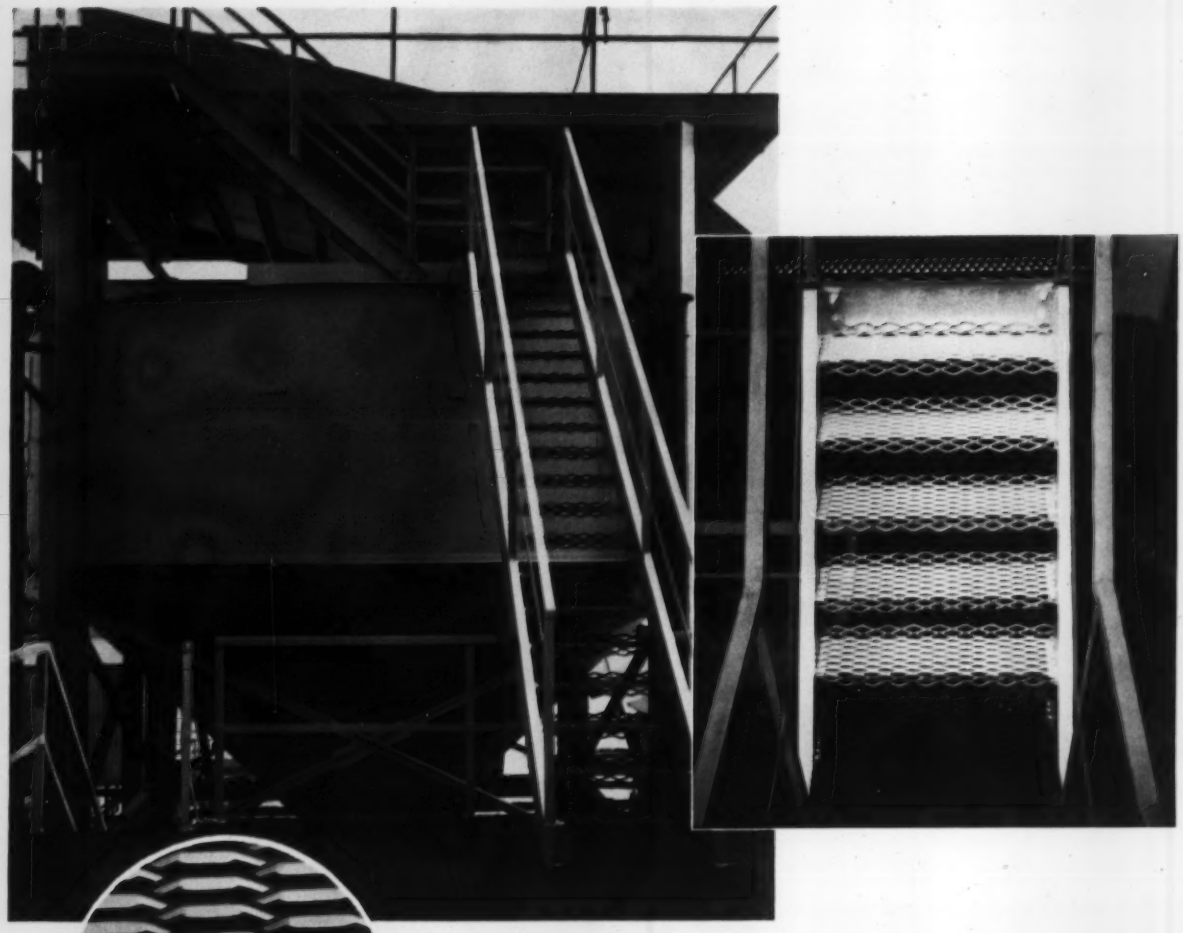
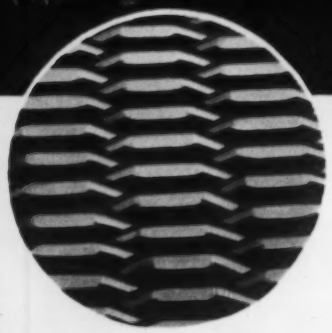
PERMACEL® TAPES

In our complete line, there's a self-sticking tape for every job . . . write Permacel Tape Corporation, New Brunswick, N. J.

a Johnson & Johnson company





← cuts costs up to 25% on FLOORING and STAIR TREADS

Armour and Company, near Bartow, Florida, had a grating problem: How to provide 18,000 square feet of open steel flooring and several hundred stair treads, for structures in their new Phosphate Recovery Plant... *economically!* The flooring and treads had to be open to allow drainage of water used in the washer operations. Their solution: Penmetal 4.27 TREADWAY (expanded metal grating).

Used as flooring and stair treads instead of conventional grating, Treadway cuts costs up to 25% per square foot of floor area.

The photographs above illustrate typical sections of floor area, and the unique method used in the fabrication of the stair treads. Each tread is a single piece of Treadway turned to a 90° angle at the front and rear edges. This forms a kick plate and makes the tread even stronger. Most of the treads in this installation are 36" long and will support a 200 lb. man at mid-span, with no apparent deflection.

This rugged, economical steel grating, with slip-resisting safety inherent in its design, is practical for many other applications where safe footing, durability, fabrication costs, and appearance are factors.

Send for complete details of this open steel flooring of economy.

PENN METAL COMPANY, INC.

General Sales Office:
205 East 42nd Street, New York 17, N. Y.
Plant: Parkersburg, W. Va.

Penmetal

PM-73

Technical Outlook

GROUND OUT—For two years Frigidaire Division of GM has been testing a porcelain enamel that bonds successfully to cold-rolled rimmed steel and enameling iron without a ground coat or nickel flash. Conclusions: The new enamel permits reduced coating thickness, gives straighter parts with less bowing, yields fewer rejects and reduces the types of frits required. Called Parker Pre-Namel 410, it's a development of Parker Rust Proof Co.

HOTTER THE BETTER—Designers would be happier if high hot strength were a more common quality. Not many materials get stronger as they get hotter. Silicon carbide is one which shows this uncommon property in the 1500-2500°F range, says Electro Refractories & Abrasives Corp.

THE ECONOMIC ATOM— U. S. Industry will spend $300 million during the next four years on atomic research alone, say Drs. Henry H. Hausner and Stanley B. Roboff of Sylvania's Atomic Energy Division. They predict: 1. Manufacture of reactor components alone may exceed $700 million by 1963. 2. The atom industry will need 40,000 scientists and engineers by that time.

GLOW SLOW—Radioactive signs, long used in Germany, may soon turn up on our highways. Bettinger Corp. has acquired patent rights. The signs are made of radium oxide on porcelain enamel and emit a strong glow at night.

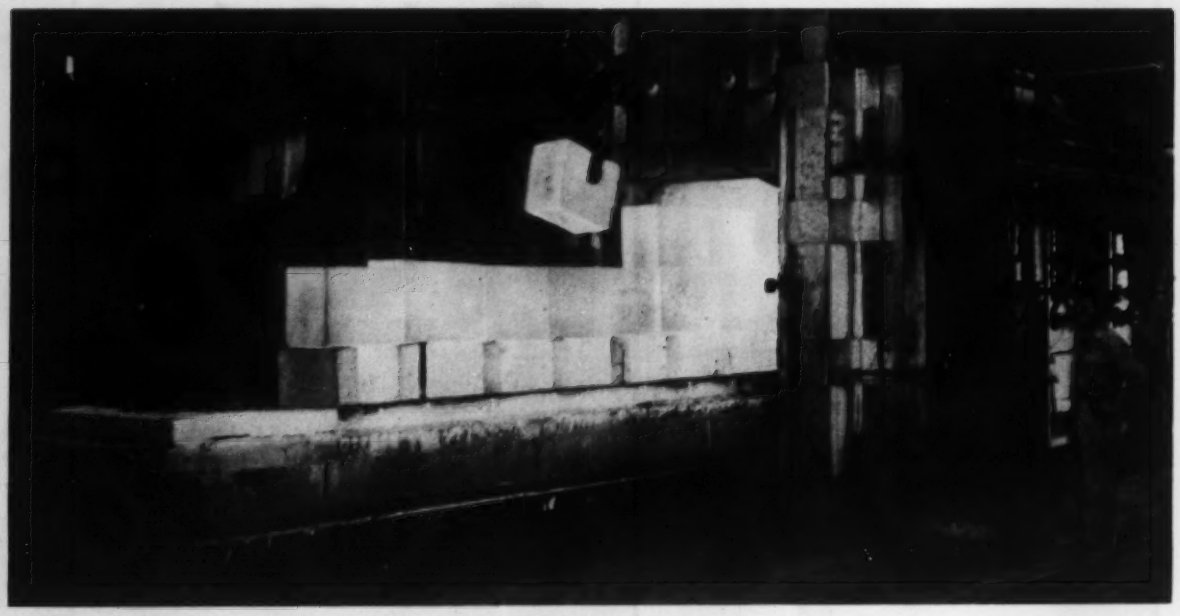
SPLITTING HAIRS: PHOOEY—The old saw about splitting hairs doesn't particularly impress some instrument makers at General Electric's Engineering Laboratory. They have drilled a hole in a strand of nylon stocking (it's smaller than a hair) and then threaded a 0.001-in. diameter wire through the hole. Although this is a relatively impractical job, the microscopic drill earns its salt drilling tiny fuel injection nozzles, making orifices in leak discs that control the flow of gas into a vacuum chamber and drilling apertures for electron beams in x-ray equipment.

TEMPERATURE TYPEWRITER—Top plutonium production in an atomic reactor depends on the careful control of heat in the pile. It used to take hours for GE operators at the Hanford, Wash., plant to plot the thousands of thermocouple readings. Now all signals go into a special typewriter which automatically records all readings in minutes.

RESINS ON THE MOVE—How's the high-strength plastic business doing? Last year 26-million lb of polyester were used, Dr. H. A. Hoppens of Barrett Division, Allied Chemical & Dye Corp., told the SAE. The automotive industry is the big user of general-purpose polyester resins which sell for 35 to 40 cents a pound. Aircraft makers are paying another 20 cents a pound to get plastics which stand 400 to 600° F.

MARKET IN MINIATURES—Applications for its super-thin metal strip are growing fast says American Silver Co., Flushing, N. Y. Just a few uses for 0.0005 in. ($\pm$0.0001) metals: Electric blanket thermostats, heart of a miniature tape recorder, condenser plates for miniature radios, high-precision industrial relays, heat manifolds and carburetor chokes in aircraft and autos and starter mechanisms for fluorescent lighting.

Metalworking Outlook—p. 47 *Market Outlook—p. 143*



Bringing 24,000 lb of die blocks to 1550°F in 3½-hours proves . . .

Fast Heating Is Practical . . . and Safe

By H. G. GRIM
Vice President, Manufacturing
Heppenstall Co., Pittsburgh

HEATING DIE BLOCKS for hardening is no longer a 20-to-30-hour operation at the Heppenstall Co.'s Pittsburgh plant. A new, completely automatic, program control heating method, which increases heating rates 4½-times, reduces the cycle to only 3 to 4 hours for up to 20-ton work loads.

The fast heating is performed in a gas-fired, car-bottom-type furnace, employing patterned radiant heat. The furnace not only increases the production rate four to fivefold but achieves this increase in output with 20 per cent less fuel consumption per pound of steel heated. The current production rate is on the order of 3½-million lb of die blocks per month.

Crack Sensitive—Die block heating generally has been regarded as a critical, long-cycle operation. A typical die block steel, containing say 0.50 carbon, 0.70 manganese, 0.04 phosphorus, 0.04 sulphur, 0.25 silicon, 0.85 chromium, 0.40 molybdenum and 0.06 vanadium, presents a heating problem. Steels of such alloy composition are considered crack sensitive if not heated uniformly. Uniformity can only be obtained—with conventional heating methods—by slow heating and soaking.

The situation is complicated, in die block heating, by the relatively large steel sections involved. Blocks processed at Heppenstall range from 8 to 24 in. thick, and a block 66 x 24 x 18 in., weighing 8100 lb, isn't considered large.

As a result of these critical conditions, long cycle operations employ heating rates of only 100 to 150°F per hour, and soaking times of about ½-hour per inch of average cross section. A typical heating cycle requires on the order of 20 to 30 hours, based on size of work load.

Expansion Decision — This installation is the outgrowth of a search for a heating method that would enable Heppenstall to keep pace with growing production requirements. Demands had gradually increased to the point where facilities were no longer adequate, and the plant was faced with the prospect of a costly expansion.

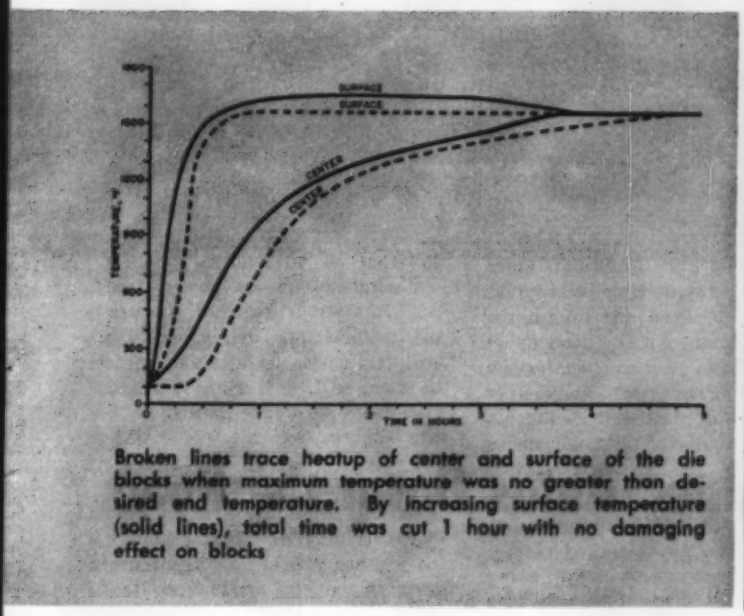
A furnace, engineered for die block heating, was designed and manufactured by Selas Corp. of America, Philadelphia, to replace one of the 13 furnaces in the line.

The equipment was delivered completely fabricated. Within one week from delivery, production tests were under way.

Here It Is—The furnace is so designed that each side wall is studded with large Duradiant gas burners of the nozzle mixing variety. They produce a flameless radiant effect. Much of their heat is transmitted by direct radiation.

The resulting freedom from impingement allows the use of these burners close to work surfaces without danger of local "spot" heating. Burners are lighted by a torch inserted through lighting ports in furnace side walls.

Test Run—Three die blocks, 66 x 24 x 18 in., were readied for the first production tests. Control was based on readings obtained with surface and center thermocouples embedded in the center block, and was co-ordinated with a radiation pyrometer for produc-



Broken lines trace heatup of center and surface of the die blocks when maximum temperature was no greater than desired end temperature. By increasing surface temperature (solid lines), total time was cut 1 hour with no damaging effect on blocks

Control cams (inset) are cut from temperature-time recording charts for optimum heating cycle. The stylus follows cam surface and regulates air and gas fuel ratios accordingly

tion purposes. The center thermocouple was in the geometric center of the workload.

In keeping with the metallurgical concept that no portion of the work ever exceed its final temperature, the original cycle in the gradiation furnace was established. The work surface was up to the desired temperature of 1550°F in only 45 minutes. The center of the workload (198 x 24 x 18) took but 4¾-hours to come to 1550°F from room temperature. The die block was rushed to the lab for examination. The most careful inspection, including sonic testing, failed to disclose any signs of cracks or other metallurgical defects.

More Heat—Flouting metallurgical "law," the thermal head was increased whereby the work surface was brought quickly to 1650° F, held there for a short interval, then gradually lowered to 1550°F. The work center temperature responded accordingly, reaching 1550°F in but 3¾-hours—1 hour less than before.

This cycle has been in use since, with no noticeable deleterious effects on die block quality. Having proved the ability of the gradiation heating method to produce uniform, fast heating under precise control conditions, Selas designed and put into operation a completely automatic control.

The exactness with which temperature conditions were reproduced, permitted the cutting of cams to meet the heat cycle requirements in terms of thickness of work.

Other Advantages—In spite of the momentary high peak load, over-all fuel consumption is low, in relation to the adjoining conventional furnaces. In terms of cubic feet of gas per pound of work treated, the Selas furnace consumes only 80 per cent of the fuel requirements of the other 12 units. This is a monthly average figure, and covers all operations, including heatup.

From the standpoint of reduced operating costs, the feature of automatic program control also is noteworthy:

1. Over-all plant efficiency is improved because a close production schedule can be maintained. Manpower and crane and quenching facilities are utilized effectively.
2. Less skilled and experienced personnel can handle the heating operation.
3. Minimum attention is required. Only about 20 minutes of operator's time is needed over the entire cycle.

In the early stages of production testing, we were not completely convinced as to the ability of heating die block steels at such rapid rates.

Crack in this chip was formed before heating and was not aggravated during the fast heating cycle

The skepticism seemed to be confirmed one day, when sonic testing revealed a crack in one of the hardened die blocks. To permit closer inspection of the defect, a chip was machined off the block. Our fears were groundless. At the bottom of the crack, scale formation was detected, indicating that the crack had been formed previous to hardening.

This removed all doubts. If the rapid method of heating had any crack - forming tendencies, they certainly would have severely damaged an already-cracked block.

FORD MOTOR CO.

Lighter Autos Down the Road

By LEO SWOBODA
Product Development Department
Kaiser Aluminum & Chemical Corp.
Chicago, Ill.

PASSENGER CARS of the future will be lighter, ride easier, perform better and be more economical to operate than present ones — and not at the expense of passenger and luggage space. They will get that way largely because of aluminum.

Aluminum will be used for quite different reasons: 1. A combination of desirable physical properties, including low specific gravity, good thermal conductivity, good corrosion resistance and attractiveness. 2. Promise of easier availability. 3. Lower finished cost of many items.

Brake Drums—This is one large-scale application of the future. Aluminum is particularly useful because of its ability to rapidly absorb and dissipate heat generated during braking. The low density of the metal will reduce unsprung weight, to improve riding characteristics.

Aluminum wheels and brake drums show considerable promise, but more development work is needed before they will be available for general use. However, we are predicting widespread use of aluminum here.

Cylinder Block—Another future application. Here aluminum's low density is a basic reason, but its high thermal conductivity is equally advantageous. It can save about 100 lb of engine weight, bringing improved performance and economy, and more equal weight distribution between front and rear axles.

It will compensate for weight added by power steering, air conditioning, and power brake mechanisms, usually at the front end of the car. It will improve operating conditions and increase efficiency by providing more uniform temperatures throughout the block.

Trim—Aluminum is used for instrument panels, scuff plates, floor sills, knobs, handles, instrument dials and other interior trim parts because it has good corrosion resistance, a pleasing natural appearance and the ability to take on a variety of attractive finishes. Many cars have at least one of these items made from aluminum, but we predict that more will be used. Appearance, corrosion resistance, durability of polished and anodized aluminum and its light weight will be responsible for the choice of aluminum for exterior trim.

Aluminum radiator grilles soon will make their appearance on a number of cars, introducing its use for exterior trim in the natural bright finish. Bright finished aluminum bumpers and hub caps will follow, because the metal is well suited for these parts, and they can be finished to match the grille.

The grille can be made as a stamping, casting or be built up from extrusions in designs appropriate for any class car. Besides distinctive appearance, the weight saving is particularly important because it will be made at the front end, which in most cars is too heavy for best weight distribution.

Plenty — Future availability of aluminum will stimulate increased automotive use. In this category are radiator and heater cores, electrical conductors, and some screw machine parts. The radiator core is outstanding, not only because of the large aluminum requirements, but because it once presented seemingly insurmountable problems, both in service requirements and in production techniques.

Most of these problems have been overcome through research, and we are confident that aluminum radiators will be production items within a year.

Hybrid—To speed the use of aluminum in radiators, work is progressing on a hybrid type having brass coolant passages and aluminum fins. This combination will permit zinc-tin soldering in existing furnaces with only minor changes in temperature and time settings. It will lick the problem of costly flux loss, which approached $1 per core with former production methods.

With this type radiator, corrosion from exposure to road splash can be solved by using commercial protective coatings on the outside of the finished core.

The all-aluminum radiator is still the ultimate goal, and new fluxes will overcome objections to present ones. The new fluxes should be available commercially within a year.

Conductors—The next most promising use, based on predicted availability, is for electrical conductors—field coils and armature windings in electric motors, generators, starters, battery cables, ground straps and wiring harness.

Aluminum wire is being used, either fully or in part, for the above applications. We can see only increased use.

Low Cost — Aluminum applications made on a basis of lower finished part cost, without sacrificing quality or service life, are numerous. Examples are the headlamp retaining ring and sockets. Many are being made of aluminum, wholly on the basis of lower finished cost. Other parts are valve assemblies, stators and impellers, extensions for automatic transmissions, flywheel housings and screw machine products.

Fast Finish — The savings in aluminum valve bodies and covers are made chiefly by reduced cleaning and machining time. These parts have many deep, intricate passages and ports directing the flow of oil. When they are made of aluminum, less labor is required for inspecting, removing obstructions and smoothing rough areas. Also, machining time is lower for aluminum diecastings than for iron castings.

Lower finished costs of the cast aluminum stator and impeller are due largely to their lower fabricating and machining or finishing costs. It no longer is necessary to fabricate individual pieces and assemble them, with the resultant high labor costs.

Aluminum flywheel housings and automatic transmission extensions are lower in finished cost because of the lower fabricating cost of the rough casting, lower machining costs and the elimination of painting. The great difference in material costs for an equal number of parts is responsible for the major savings in aluminum screw machine parts, but additional savings are possible because of higher permissible cutting speeds and increased tool life. In many cases it is possible to use machine-finished parts without additional buffing or plating.

Plus Factors—In some applications secondary benefits may exceed those gained by the primary reasons for using aluminum. For example, although weight reduction may be the determining factor in choosing aluminum for cylinder blocks, the manufacturer that produces them may also gain through lower finished part costs. This is particularly true if cylinder blocks are diecast. Although aluminum is being considered for radiator cores because of presumed supply at a stable price, reduction in cost may amount to $4 per unit, and the reduction in front-end weight to 13 lb.

Aluminum, chosen for automatic transmission parts because of lower finished costs, also has made it possible to eliminate water cooling devices. A reduction in oil temperature of over 15° F is possible under peak output of automatic transmissions merely through the substitution of aluminum in the major components.

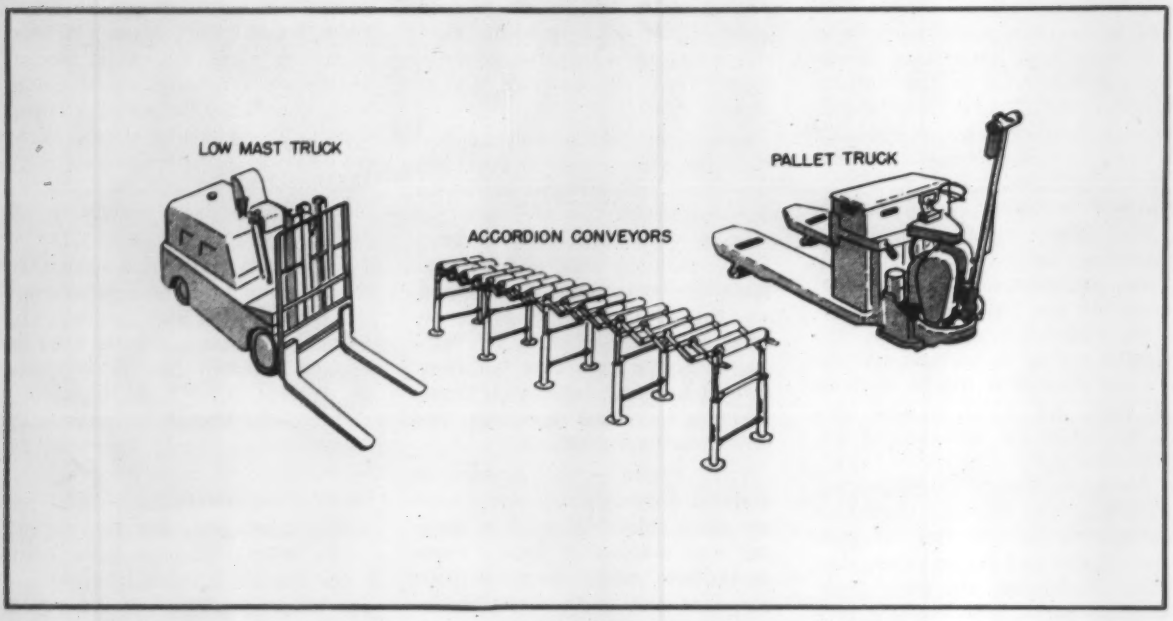
Die Casting—Lower fabricating costs, where savings have been large enough at times to overcome any differences in initial metal cost are possible through diecasting which eliminates the need for sand cores and for associated facilities, such as coremaking, sand shakeout and sand reclaiming.

Diecasting does not limit the designer to an abnormally thick metal section as a minimum, but permits him to specify the correct wall thickness needed to carry the load. It is not necessary to add 1/16-in. to wall thickness to allow for coreshift or to assure complete filling of the mold cavity.

Many Parts—Aluminum diecastings are being considered for automotive parts ranging in size and service requirements from small knobs to highly stressed clutch housings. Passenger car doors have been die cast successfully.

None of these compare in size or complexity with cylinder block castings, which we predict will some day be made as aluminum diecastings. A diecasting machine capable of producing castings weighing up to about 75 lb is in operation and will be used for producing experimental 6-cylinder engine block castings. It is entirely feasible to die cast V-type cylinder blocks in this machine, and this may well influence engine design in future.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department, STEEL, Penton Bldg., Cleveland 13, O.*



BETTER MATERIALS HANDLING—III

Design Speeds Unloading

By BYRON E. KENNEL
Assistant Editor

MATERIALS HANDLING starts at your back door with rail and truck receiving facilities. Plan them to fit into your system.

The new assembly plant of Ford Motor Co. in Louisville is built to receive about 1800 tons of material daily. Most important is the rail unloading dock—85 per cent of the material comes by rail.

A dual track extends the length of the building. It is parallel to the final assembly conveyor, which is on the opposite side of the building.

Factors—Link the rail dock to production departments. Take into account the ease of spotting cars, time elapsed in making switches and the distance material moves. The goal is to spot cars adjacent to the using department.

There is only a small area of the dock where each rail car can be spotted for the most efficient flow of material. Spotting in the same place each time will help the unloading foreman assign his men and equipment.

Included in the unloading equipment is the electric pallet truck. It moves pallets not accessible to a lift truck. Ford uses a 4000-lb capacity lift truck with a 100-in. lift for unloading in freight cars. Other trucks have 130-in. lifts, capacities are 4000 and 6000 lb.

On the Dock—Here are Ford's instructions for rail unloading: After opening the car door and setting the dockboards, make a careful inspection of car dunnage. Check materials received against the packing slips. Quantities counted must be reflected on the billing.

All material should be loaded directly onto wheeled equipment in standard unit loads. Their use will insure proper exploitation of storage space and equipment, facilitate cycle checking and simplify line feeding.

As each load is completed it should be pushed out of the car doorway and positioned parallel to the unloading track to facilitate an easy hookup by the tow tractor operator.

Partial unit loads should be taken directly to the production operation as should loads showing visible damage to pallets or containers.

Priority—A challenge to efficient unloading is the "hot" list. Preferred are shortage lists that give the time needed on the line. Often it is possible to expedite shortage items from the cars without special digging and special delivery.

Unloading crews always should be trained to notify the foreman when damaged materials are found. Before the evidence is removed, it often is possible to prove carrier responsibility.

The Truck Dock—Factors in the location and operation of the truck dock are similar to those in the rail dock. Layout of truck docks should permit the truck driver to back in easily.

The truck dock at Louisville is 60 ft wide; it provides an area for unloading, a traffic aisle and a detention area for material awaiting checking or inspection.

Good relations with trucking companies depend upon fast unloading.

Emergency shipments made by truck may not be packaged properly. Provision should be made to restack or repalletize the occasional failure. Don't send problem loads into the plant.

Storage—Storage is the bank of stock to protect production. The size and shape of the storage area is determined by the quantity, container and accessibility required by the stored article.

Some materials, such as paints, must be handled on a first-in first-out basis.

Reserve storage areas should be in line between the unloading dock and use point. If at all possible, they should be serviced by aisles on all sides.

Most economical storage is outside when no harm results to the material. Paved areas make all-weather operation possible.

Here's How—Warehousing foremen must keep the production line filled with the right parts at the right time. A convenient place next to the production operation must be designated for each item.

Each storage location has to be identified with the correct part number.

Stocks must be maintained on the line at all times.

Feed fast moving materials to the line on wheels when possible.

When space is limited, slow moving stock should not occupy choice front-line locations. It's better to walk a few steps occasionally to get low usage items than to be continually inconvenienced on fast-moving stock.

Stock on the line must be piled neatly and safely.

This is the third in a series of four articles on better materials handling. The first two were on planning handling facilities, July 4, and module units, July 11. Next week's article will be on the lift truck-tow train team. Extra copies of each article are available in quantities from one to three until the supply is exhausted. Write Editorial Department, STEEL, Penton Bldg., Cleveland 13, O.

Duties of Unloading Supervision

Before . . .

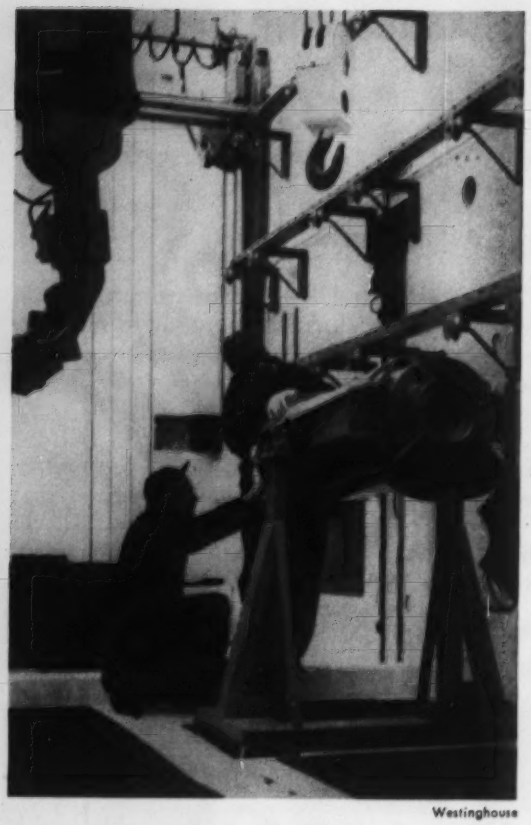
- Analyze the freight car arrival list.
- Prepare the switch list for railroad spotting giving due regard to getting oldest cars unloaded first, expediting shortage items and the availability of storage space. Balance cars to track space, fork lift time and manpower.
- Allocate the labor force to specific cars. If possible, feed plant operations directly from the car.
- Check the availability of both container and power equipment. Keep the labor force constantly productive.

During . . .

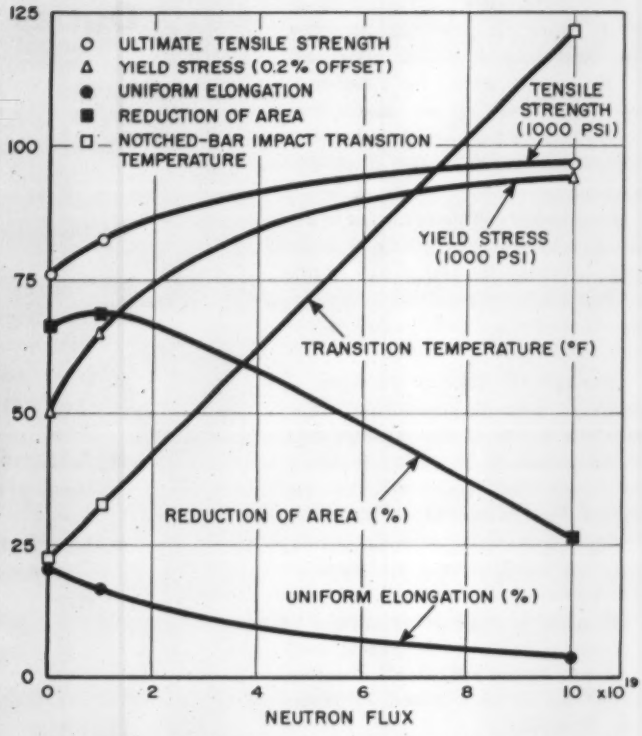
- See that needed equipment is kept available and is properly used at all times.
- See that established unloading procedures are used.
- Make sure that loads move promptly from the unloading dock. Prevent congestion.
- Keep freight car equipment available for return in the same car in which it was received.
- See that all discrepancies, shipping complaints, carrier claim cases, etc., are properly reported.
- Give special attention to the shortage list.

After . . .

- Make sure all material has been removed from cars.
- Make sure return loading instructions on each car have been followed.
- Check packing slips and turn them in promptly.
- Reassign manpower to other cars.
- Make sure car doors are closed and sealed.



Westinghouse



How neutron irradiation affects mechanical properties of A-212B carbon-silicon steel

Properties of Steel Will Be Changed by Irradiation in Nuclear Power Plants. This Means . . .

Neutrons Cause New Problems for Metals

OUR PRESENT tests won't predict the service life of metals for atomic power plants.

Irradiation causes carbon and stainless steel to behave so differently that a new concept of mechanical test values is needed. So when the first specification is written on steels for nuclear reactors, metallurgists will come up against problems they've never faced before.

Facts—J. C. Wilson, supervisor of radiation metallurgy at Oak Ridge National Laboratory, speaking before ASTM, showed the response of irradiated metal will not be the same as unirradiated metal to conditions of stress, strain, time and temperature in service. He also found that the temperature of irradiation does not affect all mechanical properties the same way.

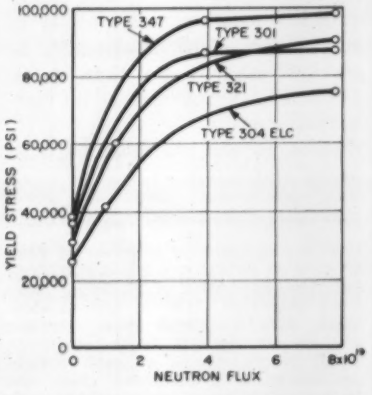
Here are some peculiarities of behavior that the testing program brought to light: The shape of the stress-strain curve for austenitic stainless steels is altered. With sufficient irradiation definite yield points come into the picture. Another effect: The yield stress of irradiated stainless alloys depends on the strain rate.

Similar—The yielding behavior of irradiated carbon steels seems to parallel the stainless alloys.

Other effects of irradiation of carbon steels: 1. A sharp increase in yield stress. 2. Elimination of modification of the yield point. 3. Sharply reduced uniform elongation. 4. Elevation of the transition temperature in the impact test with lowering of the energy requirements for ductile fracture.

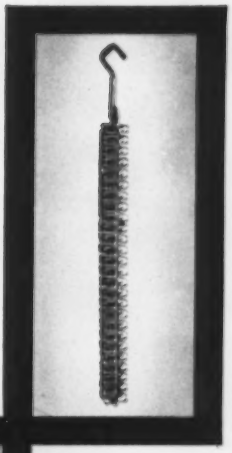
More Trouble—Neutron radiation levels used in Mr. Wilson's tests (about 10^{20} nvt) were 100 to 1000 times lower than may be encountered in power reactors. With more irradiation, differences that were unseeen in these tests may be important.

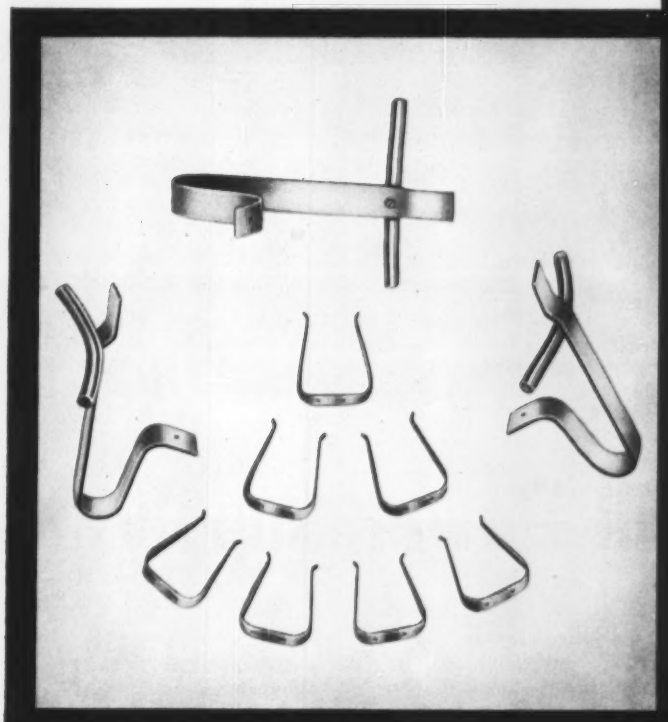
Transmutation effects and metallurgical changes will be of importance in many alloys after long, high neutron irradiations.



How neutron irradiation affects yield strength of stainless steels

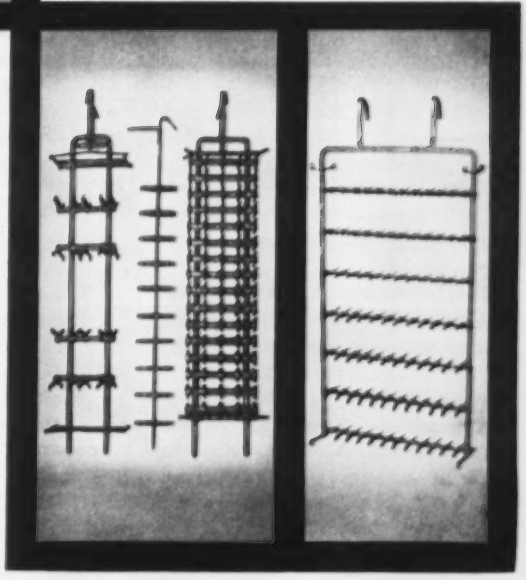
Spring quality of
REVERE
PHOSPHOR BRONZE
—important to Higgins Rack





When small parts have to be plated, the problem arises as to how to hold them on the plating racks. If they are not heavy enough to hang by their own weight, spring clips must be used. For such clips, the Higgins Rack Coating Mfg. Co., Hazel Park, Mich., uses spring temper Revere Phosphor Bronze Strip. This material is specified because its spring temper gives it the ability to withstand repeated flexing, so that the clips can be used repeatedly, and that small parts can be snapped in and out of them quickly and without distortion.

The racks to which these clips are attached are made of copper bar; the clips are fastened by riveting and soldering. Everything except the contact points of the clips is coated to prevent deposition of the plating metal and loss of current. Higgins is an important supplier of these special racks to the automotive industry, which uses them to plate both interior and exterior trim. The efficiency and economy of this method helps make handsomer cars and trucks as well as numerous other attractive consumer commodities.



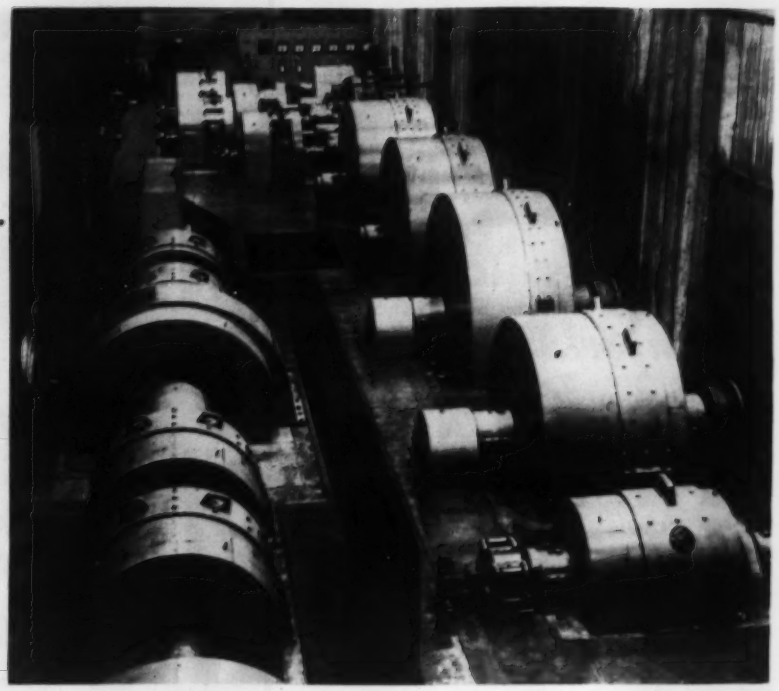
Clips and racks made to special designs by the Higgins Rack Coating Mfg. Co., which buys Revere Phosphor Bronze Strip for the clips from Copper and Brass Sales, Inc., a Revere Distributor in Detroit, Mich.

REVERE
COPPER AND BRASS INCORPORATED
Founded by Paul Revere in 1801
230 Park Avenue, New York 17, N. Y.

• • •

Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N.Y.
Sales Offices in Principal Cities, Distributors Everywhere.

By C. C. THOMAS
Systems Application Engineering
General Electric Co.
Schenectady, N. Y.



There is a total of 24,000 hp supplied by 19,300 kw running this 56-in. mill in the Pittsburgh area. It was the first in this country to have individual power supply for each stand

Trends in Mill Power Supply

RECTIFIER POWER and individual power supply for each mill stand are the two big trends on the electrical side of hot strip finishing mills. There are economic and engineering advantages that should be explored if you're contemplating new facilities or modernization.

The rectifier trend is quite well established. Of more than 40 wide mills built since 1926, ten of the last 14 installations have been rectifier supplied.

The second trend is more recent and less well known. The first mill to use separate power supply for each stand was installed in Germany in 1937. In 1952 a Pittsburgh area producer installed separate generators for each stand of its 56-in. mill. Two years later a 60-in. mill in Detroit went into operation with individual pumpless rectifiers for each stand drive. Two other mills are operating on individual power supplies, too.

Why Rectifiers—Because there is a trend toward rectifiers for mills of this type does not mean that generators will not occasionally be the proper choice. There are certain advantages and limitations to both.

When compared to motor-generator sets, rectifiers normally have these advantages:

1. Higher efficiency.
2. Lower installed cost.
3. Lower maintenance cost.
4. Higher momentary overload capability.
5. No fault contribution to the alternating current system.

Rectifiers, however, suffer by comparison with m-g sets because of these limitations:

1. Lagging power factor.
2. No capacity to receive regenerative power.
3. More expensive to obtain continuous reduced voltage operation.
4. Direct-current voltage reflects alternating-current voltage variations.

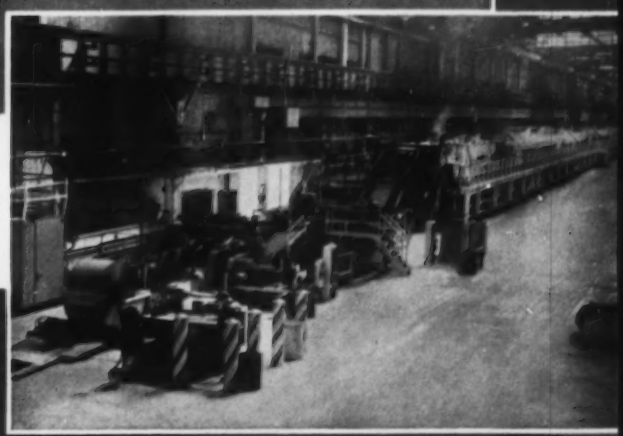
Why Individual Power — In earlier mills little thought was given to individual power supply for each stand because it was normal practice on common bus systems to assume and take advantage of diversity of stand loading and thus select a smaller power supply. For example, one 6-stand mill has 28,500 hp connected to a common bus which is supplied by a 15,000-kw power supply. To supply this mill with individual power would require 22,800 kw.

Even though the economics of this case is clear-cut, modern rolling practices and schedules are more frequently utilizing all stand

HIGH-SPEED CONTINUOUS PICKLING LINES

Designed and Built by MESTA

MESTA HIGH-SPEED CONTINUOUS PICKLING LINES WITH TRIMMERS, UP-COILERS AND MESTA-THOMSON FLASH WELDERS



Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY · PITTSBURGH, PA.

Rectifier power supply for one of the stands is rated 4000 kw, 750 v. There are 12 ignitron tanks for this one stand

motors up to their full rating, so this diversity loading factor which formerly favored common bus systems is gradually approaching unity.

High-Speed Regulators — The need to keep the stand speeds synchronized was also strongly in favor of common bus systems until the advent of the high-speed-of-response regulating systems. There are some regulators on the market which appear to even favor the individual power supply for best speed correspondence.

One of the big disadvantages of the common bus system is the staggering magnitude of potential fault current. Such a system, for instance, with 16,000 kw and 23,000 hp, is capable of contributing 700,000 amp to a solid bus fault. While fortunately such faults are rare, the danger always exists. Expensive protective equipment is a must.

Greater versatility is inherent with individual power supply since each stand speed can be individually controlled by voltage. This allows the speed cone to be widened, permitting a wider range of schedules to be rolled.

Combination Systems — Advantages of both rectifiers and individual stand power supplies are not necessarily limited to new installations. One modernized mill now going into service originally had 23,000 motor horsepower supplied by 16,000 kw (six 1500-kw generators and two 3500-kw rectifiers).

A total of 8000 hp was added (four 2000-hp motors driving through existing 3500-hp motors) and four more rectifiers (two rated 2500 kw and two rated 3000 kw). This arrangement allowed one generator and one rectifier operating in parallel to supply power for each stand.

This is the first strip mill in the U.S. to have separate rectifier power supply for each stand. Installed in 1954, this Detroit area plant has a total of 28,500 hp supplied by 22,800 kw

Turning Made Easy

Automotive stem pinions are finished in a single chucking on hydraulic tracer lathe

A COMBINATION of hydraulic tracer turning and auxiliary tooling on a rear slide enables automotive stem pinions to be completely machined in a single tracer lathe. The part, an SAE 4620 forging, is machined at a spindle speed of 1046 rpm and 0.027 in. feed. Turning is done dry or with coolant depending on the machining preference at the several installations.

In order to do the job in a single chucking, including turning the head, carbide driving inserts are used on the spindle and eliminate the need for any chucking arrangement that would interfere with taking this cut. Face drive inserts perform the turning operations close to the spindle.

Fast Turning — Nearly two pounds of metal are removed from each forging during this one-setup operation. The rear carriage with its special tooling turns the thread diameter and the head while the tracer turns the stem.

Despite the high rate of metal removal, exceptional tool life has resulted for the standard diamond-shaped carbide tools used. This important advantage results largely from the rigidity inherent in the massive construction and the downward tool pressures that are features of the machine's design. Hydra-Feed Machine Tool Corp., Ferndale, Mich., is the builder.

No Chip Problems — Although metal is removed in large volume, chips do not interfere with maximum operating efficiency. Since the slide and the template are both located on the top carriage, chips drop into the full-width, full-depth chute without lodging on any vital machine components. Nor is there any possibility of soluble cutting oil getting into the hydraulic system and resulting in maintenance.

Even with the hand loading used at present, production per shift is high because of the rapid cycle, ease of loading because the front of the machine is unobstructed by tools or slides and the short tool change time made possible by this same feature. Automating this job should be fairly easy.

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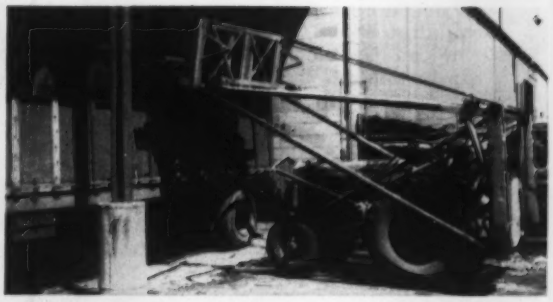
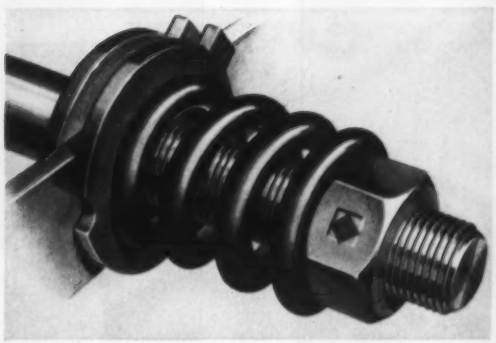
K-6978

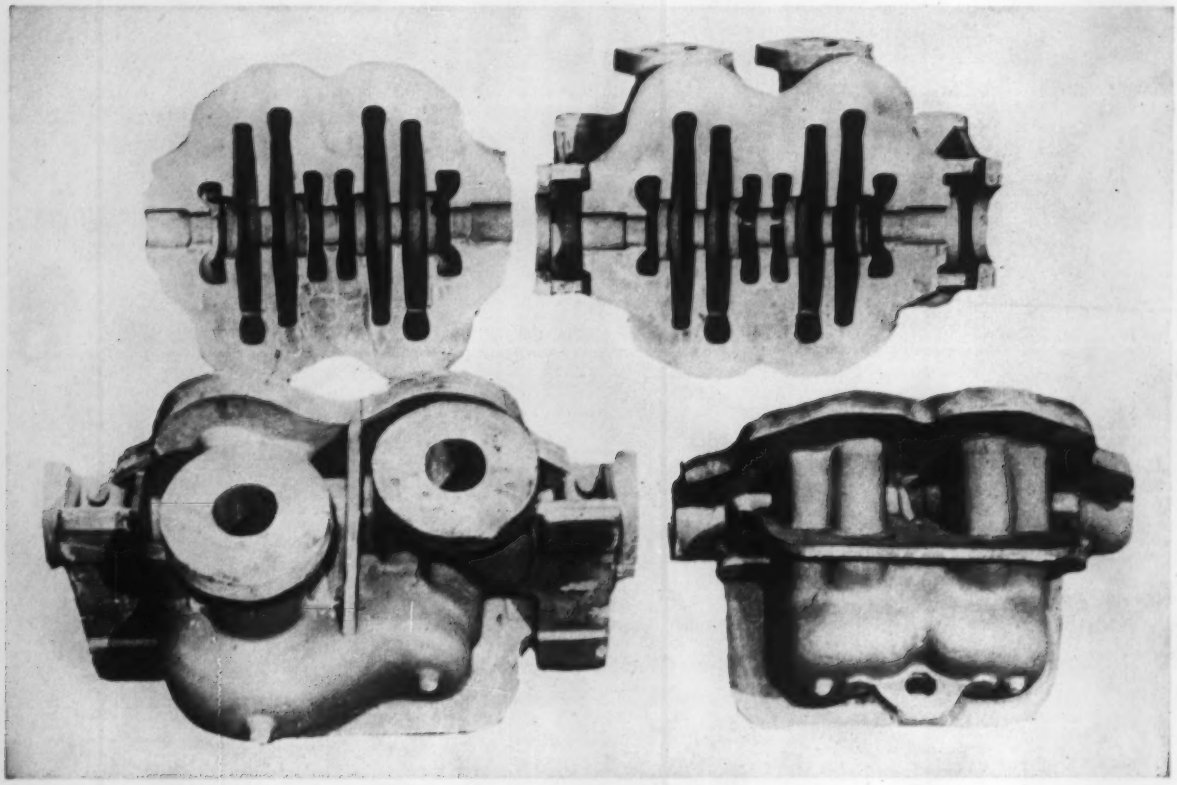


YOU CAN MASTER PROBLEMS LIKE THIS with ELECTRUNITE Mechanical Tubing. Interior scratches, not detected before assembly, wore out the hydraulic fluid seals in a hurry in the hydraulic cylinder of the Farmhand Hi-Lift Loader. Farmhand discussed the problem with Republic's Steel and Tubes Division. The solution — a switch to special smooth ELECTRUNITE Tubing. The result—lower production costs; fewer rejects; consistently uniform inside surface finish; longer life for the seal. ELECTRUNITE Mechanical Tubing is available in carbon and stainless analyses.



YOU CAN BE SURE THAT THIS NUT WILL STAY TIGHT wherever you stop wrenching. It's Republic's "Nylok" Nut. A nylon plug in the side forces the nut tight against the opposite threads as the nut is turned on. It can be assembled from either end, manually or mechanically fed. Can be locked in any position. Photo shows positive adjustment of spring compression.

YOU CAN MACHINE TITANIUM PARTS like parts made from many other metals. This part is being hogged out of a titanium forging. It will then be turned, drilled, reamed, ground, tapped and threaded. Republic metallurgists recommend metals without prejudice. They will tell you whether titanium can be adapted to your product—will help you use it to advantage. Republic produces titanium and titanium alloys in hot and cold rolled bars, sheets, plates and billets.



Small pump components must be cast into intricate shapes

GRAY IRON CASTINGS:

Answer to Intricate Hydraulic Design

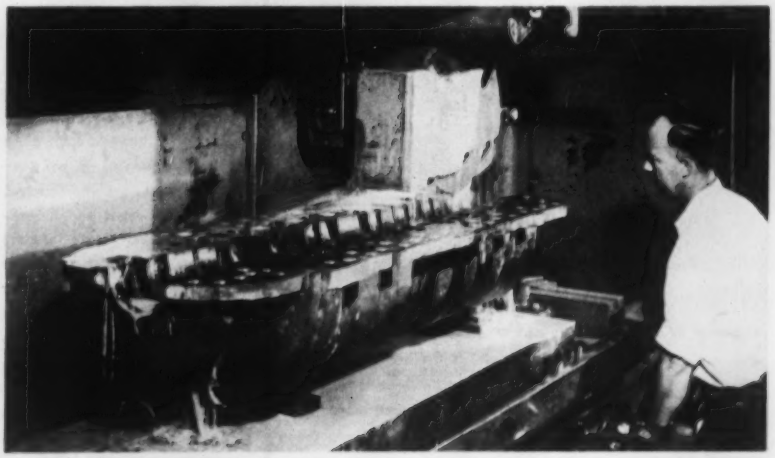
ALMOST without notice, cast iron has gained a foothold in the hydraulic component business. A few years ago, designers shunned castings in high-pressure jobs — said they couldn't take the punishment.

Castings have come a long way. They meet the three basic requirements: Rigidity, pressure tightness and castability. With the added advantage of being a low-cost approach to complicated shapes, castings have proved indispensable.

Byron Jackson Co., Los Angeles, manufacturer of hydraulic pumps, selected Meehanite castings for its general-purpose applications after recording case histories of castings for ten years.

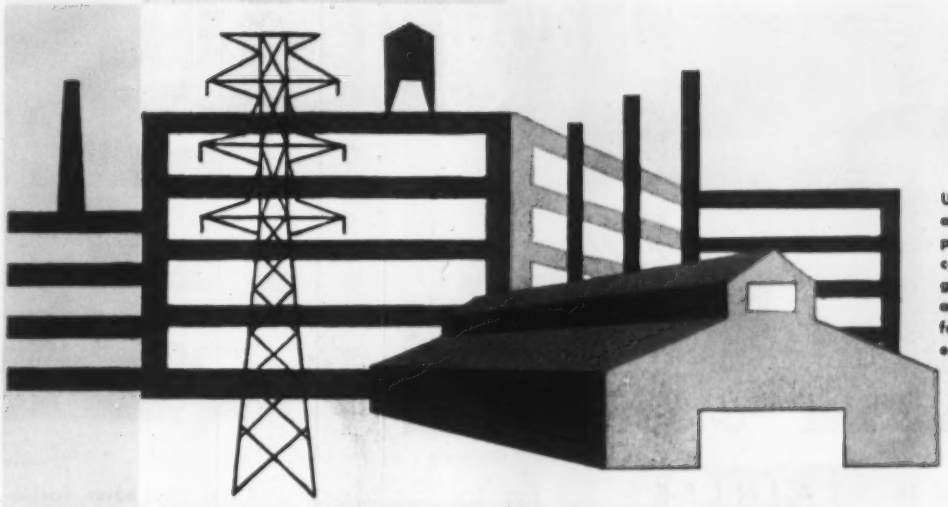
Reasons — Tensile strengths of general engineering types of Meehanite range from 45,000 to over 55,000 psi (determined by standard ASTM 1.2-in.-diameter test bars). Tensile strength drops slightly as the section size increases beyond 1 in. Yield point is about 80 per cent of the tensile strength.

To get complete density or casting soundness, all manufacturing processes must be controlled carefully, from the selection of raw material to the shake out of solidified castings. Density affects not

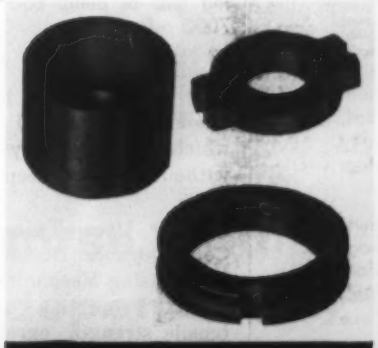


Tolerances as close as ±0.0005 in. must be held on hydraulic parts

PRODUCTS that are improving the efficiency and speeding production in American industry



USG® Brushes are available in production or replacement lots in carbon, carbon-graphite, electrographitic, pure graphite and metalgraphite grades for all types of rotating electrical equipment.



GRAPHITAR® (carbon-graphite) is a versatile engineering material of carbon-graphite composition offered in many grades for bearings, seals, piston rings, pump vanes, thrust washers, valve seats, pistons, bushings.

Metallurgical graphite grades for carbon control in iron and steel melting, mold coatings, hot topping compounds, Cordip®, Mexaloy® for refractory mixtures and other MEXICAN® products.

GRAMIX®: Sintered-metal bearings, gears, cams, slides, rollers, bushings and machine parts available in ferrous and non-ferrous alloys. The metal with the built-in lubrication.

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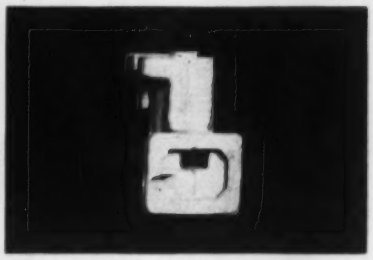
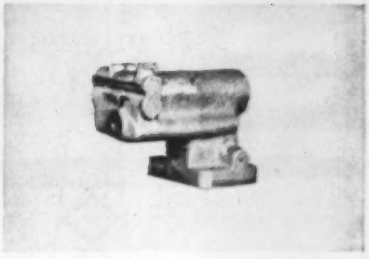




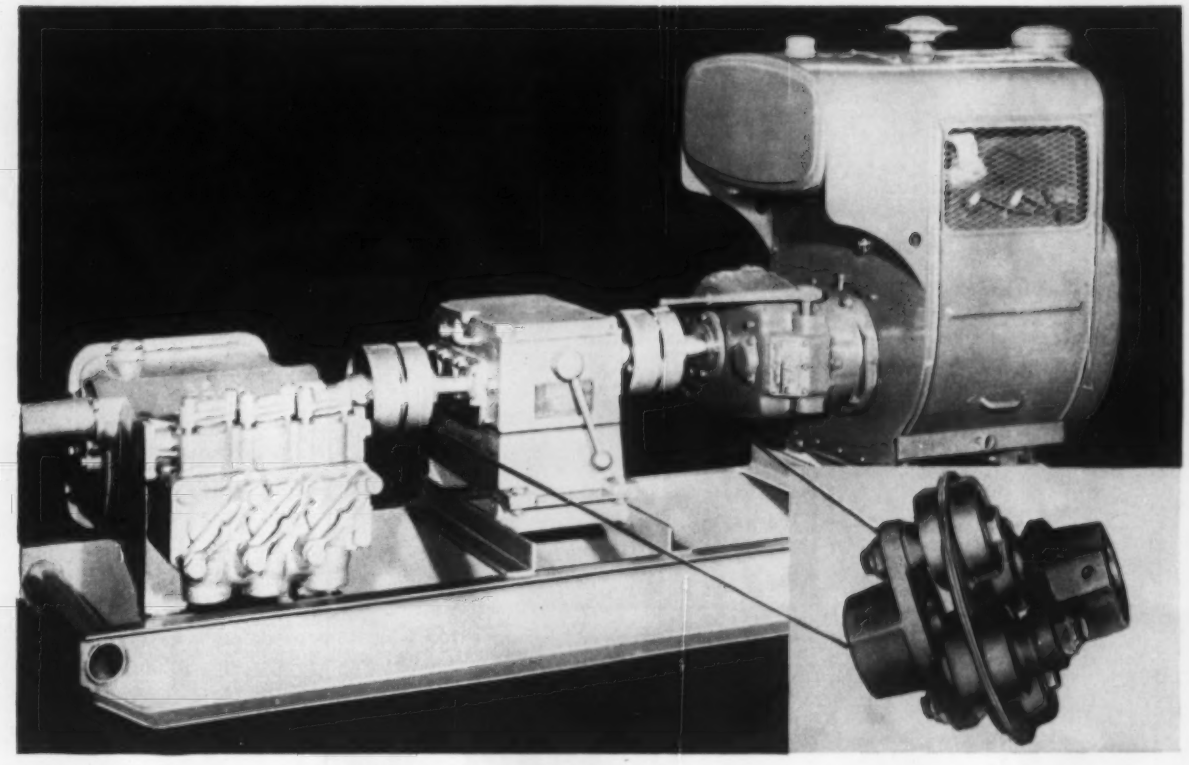
Complicated core (top) saves machining time of pump body subjected to 7000 psi pressure

only the strength but also the amount of internal pressure to which a casting may be subjected without weeping, seepage or bursting.

Other Uses—Twin Disc Clutch Co., Hydraulic Division, Rockford, Ill., is using Meehanite in seal nose pieces. Properties required: High tensile strength, excellent wearing properties and uniform hardness in the heat treating process.

The pieces are heat treated after machining. They are brought to a heat of 1580-1610° F for 6 to 8 hours and packed in fine carburizing compound to prevent decarburization. Then they are quenched in oil and drawn at 400-425° F for 4 hours.

Owatonna Tool Co., Owatonna, Minn., specifications demand that castings used in its hydraulic pullers be free from permanent dimensional changes. In this unit, ram body castings were tested to 24,000 psi, and the 30-ton unit was tested to destruction at an applied load of 87 tons.



John Bean Core Drill Pumping Unit, Model 435CD, is a highly versatile machine used to flush diamond core drill cuttings from drill holes. In shaley structures, it can immediately be converted from mud to cement pumping. Its unique 3-speed transmission enables it to vary discharge capacity from 11 to 35 GPM, at pressures from 300 to 700 PSI.

The compact coupling arrangement enables the complete pump assembly to be mounted on one skid, greatly facilitating erection, disassembly, and transportation.

Morse Morflex Couplings (shown at right without safety covers) are ideally suited for a job such as this. They are flexible: are capable of transmitting power smoothly, absorbing variant shock loads, and compensating for severe torsional and dimensional misalignment.

Morse Morflex Couplings prove their dependability in new pumping unit

Morse Morflex Couplings were specifically designed to meet machine requirements such as those of the John Bean Core Drill Pumping Unit.

Morse Morflex Couplings do not require lubrication and maintenance, because there are no moving parts to wear. They accommodate all conditions of misalignment and torsional load vibration by elastic deflection of neoprene biscuits. They are impervious to water, dirt, oil, and weather conditions; they are compact, and dependable.

Morse Morflex Couplings offer smooth, vibration-free power transmission without undue thrust loads on the drive shaft bearings. Shock loads are cushioned, bearing life prolonged, and quiet operation is assured. And most important—downtime is reduced to a minimum!

Investigate the many advantages of using Morse Morflex Couplings, as well as other Morse precision-built power transmission products, on your equipment: Morse Roller Chain, Sprockets, Roller and Silent Chain, Couplings, Cable Chain, and Clutches. MORSE CHAIN COMPANY, INDUSTRIAL SALES DIVISION, ITHACA, NEW YORK.

MORSE

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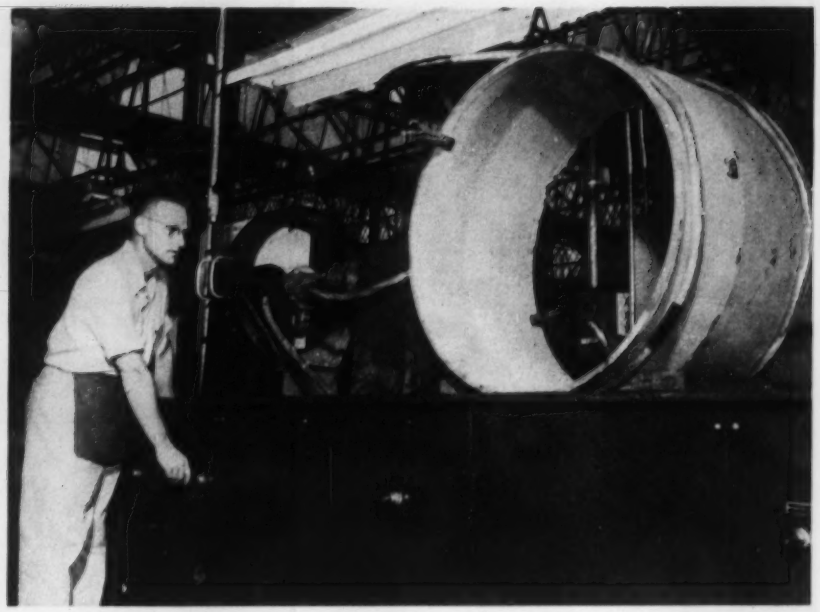
CHAINS, CLUTCHES, AND COUPLINGS

Structural soundness of jet engine parts must be completely assured. Here's an area . . .



J-65 jet engine component is magnetized prior to magnetic particle inspection

Where Testing Plays Vital Role

GLEAMING combustion chambers, seething afterburners and fiery rocket motors have to be as perfect internally as they are accurate dimensionally.

Visual inspection does not go far enough. Insurance against flaws in metal structure requires modern nondestructive testing methods.

Case in Point—Production line inspectors at Ryan Aeronautical Co., San Diego, Calif., use a variety of these techniques to search out defects in components for jet engines, afterburners, rockets and ramjets.

Two complete x-ray installations explore castings, forgings, welded tank rings and other parts. The company's largest machine employs a tube with a maximum output of 250,000 volts at 10 milliamperes.

Weld Checks—Inspectors, for example, x-ray all fusion welds on Pratt & Whitney's J-57 jet engines, Westinghouse's J-46 afterburners and Boeing's B-52 structural members.

For disclosing minute surface cracks, pores and discontinuities, Ryan finds fluorescent penetrant inspection more effective than x-ray.

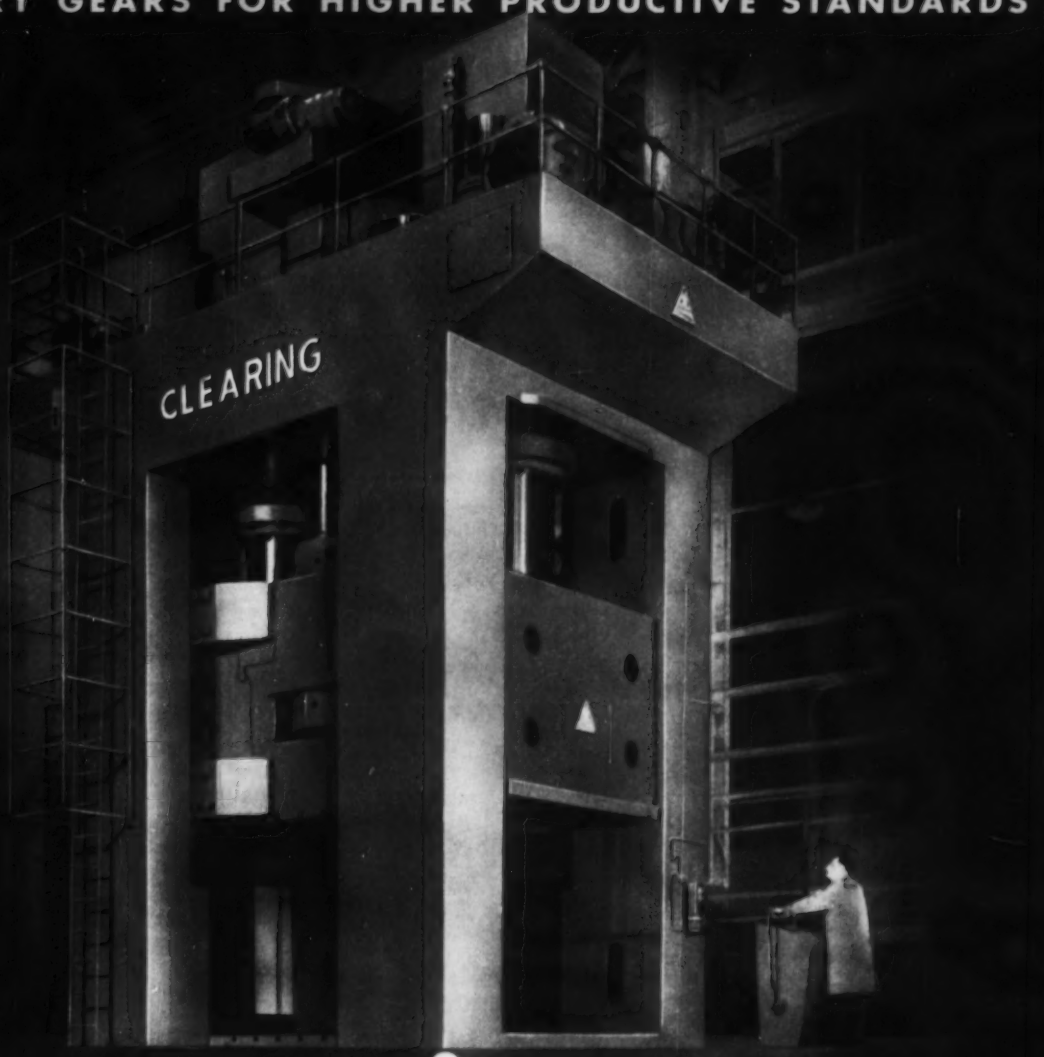
Method—Parts are coated with a penetrant containing fluorescent particles, then allowed to stand 30 minutes while the fluid seeps into all fissures. A water spray removes excess penetrant. While still wet, parts are sprayed with a developer, then dried in an oven for 5 minutes. As the developer dries, it draws the penetrant from the crevasses by capillary attraction. Under ultraviolet radiation, glowing particles display the exact location and pattern of each defect.

At Ryan a conveyor system carries parts through the application, washing, drying and viewing operations of fluorescent penetrant inspection.

Another Technique—When testing in the field or checking large immobile structures, inspectors use

Worker (left) sprays parts with fluorescent particles while another (right) prepares them for viewing in ultraviolet booth in fluorescent penetrant inspection

INDUSTRY GEARS FOR HIGHER PRODUCTIVE STANDARDS



C.P.C.* helps ALCOA trim massive forgings....and trim some costs too

Trimming a massive aluminum forging presents an unusually tough production problem. The irregular shape of the parts imposes tremendous off-center loading on the press ram. Then, too, the point at which the material shears is unknown. When the resistance against the ram changes, in a split second, from, say, 1,500 tons to absolutely nothing, the shattering effect of break-through shock is the result.

Many problems as complicated as these had to be worked out by "Clearing Productivity Consultants before they submitted plans for the press shown above to Alcoa engineers. An important consideration, for example, was manpower. In spite of its size, this machine is operated by just one man. From the remote, pulpit-like control station, the operator gets a wide-open view of the die area and he can put the full 2,000 tons of pressure to work with surgical deftness and precision.

Few people have a problem exactly like this one. But if you're thinking about boosting efficiency of your press-working facilities, we'd like to talk things over with you. Call on us at any time at no obligation.

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the dye penetrant method. It requires a minimum of equipment which can be readily carried.

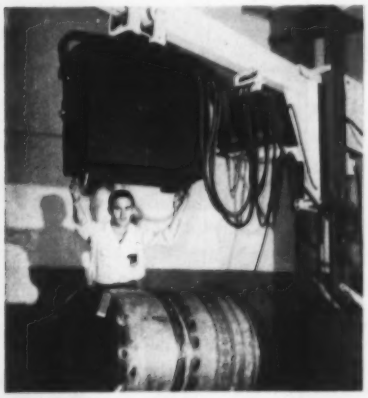
An inspector cleans the surface and applies the penetrant, which contains a red dye. He allows 5 to 15 minutes for the penetrant to soak into surface imperfections, then removes it with a solvent. When parts are dry, he applies developer in a thin coat. Red dye from fissures can be seen against the white background of the developer film.

Magnetic Particle — When parts are of magnetic alloys, the aircraft company uses magnetic particle inspection to find surface defects. This technique requires less time and is applicable to all sizes and shapes of parts.

In magnetic particle inspection, parts are dipped or sprayed with a thin oil containing iron oxide or other particles which will respond to a magnetic field. When parts are magnetized, the finely divided particles adhere to any surface defect, showing its location.

Spectroscopy—Ryan employs another inspection device (spectroscopy) which cannot be called nondestructive because it consumes a few grains of metal. Supervised by the engineering laboratory, spectroscopic examinations double check formulas of metals Ryan receives for production.

Similarly, all parts which vendors supply are checked against engineering specifications. If the quantity of each element in an alloy is critical, the laboratory makes a further examination of the sample through wet chemical methods, which provide exact quantitative analysis.

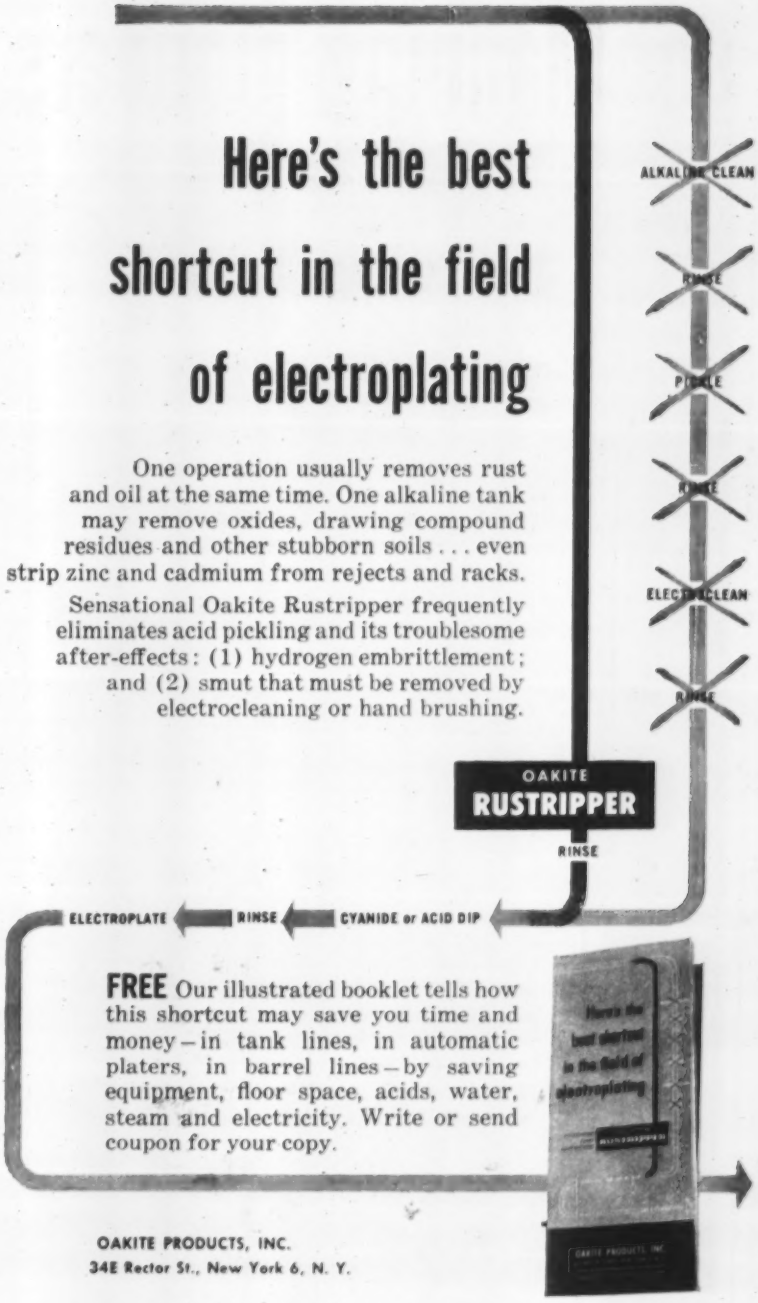


Technician positions 250,000-volt x-ray machine over jet engine casing

Here's the best shortcut in the field of electroplating

One operation usually removes rust and oil at the same time. One alkaline tank may remove oxides, drawing compound residues and other stubborn soils . . . even strip zinc and cadmium from rejects and racks.

Sensational Oakite Rustripper frequently eliminates acid pickling and its troublesome after-effects: (1) hydrogen embrittlement; and (2) smut that must be removed by electrocleaning or hand brushing.



FREE Our illustrated booklet tells how this shortcut may save you time and money—in tank lines, in automatic platers, in barrel lines—by saving equipment, floor space, acids, water, steam and electricity. Write or send coupon for your copy.

OAKITE PRODUCTS, INC.
34E Rector St., New York 6, N. Y.

Send me a FREE copy of your booklet *"Here's the best shortcut in the field of electroplating"*

NAME_____

COMPANY_____

ADDRESS_____

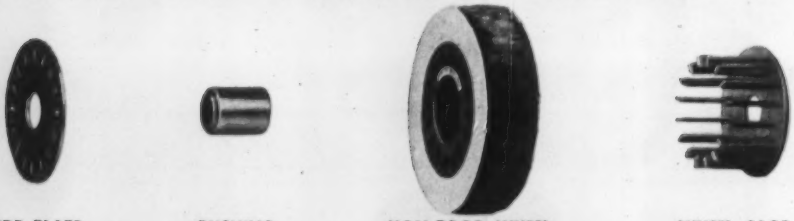
OAKITE

Technical Service Representatives in Principal Cities of U. S. and Canada

Behr-Manning pioneers an

The KON-TOOR WHEEL is ideal for automatic and semi-automatic straight line and rotary production

AN EXPLODED VIEW OF WHEEL COMPONENTS...



SIDE PLATE | BUSHING | KON-TOOR WHEEL | WHEEL CAGE

The KON-TOOR WHEEL is constructed of numerous segments of double-faced abrasives and is available in face widths 2" to 7" inclusive – Flexible or stiff construction. Multiple wheels can be used for widths over 7".

For the newest in coated abrasives... watch BEHR-MANNING!

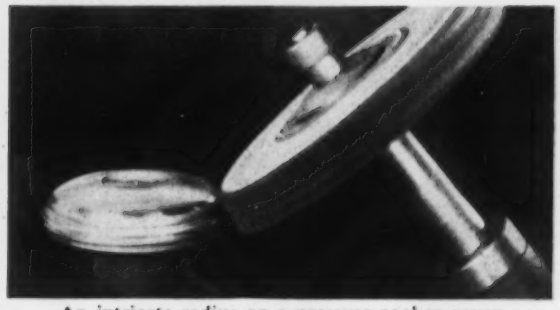
entirely new concept in polishing!

...the ALL coated abrasive KON-TOOR® WHEEL

CAN BE SHAPED TO CONTOUR

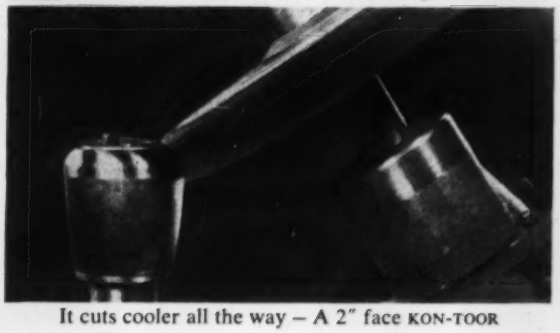
Note how the KON-TOOR WHEEL hugs the radius of this stainless steel cooking utensil.

PRODUCES FINER FINISHES



An intricate radius on a pressure cooker cover gets polished by a 2" face KON-TOOR WHEEL.

MINIMUM LUBRICATION REQUIRED

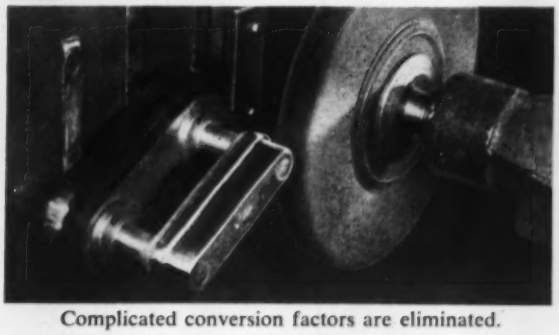


It cuts cooler all the way – A 2" face KON-TOOR WHEEL polishing a drawn steel coffee pot.

CUTS FINISHING COSTS

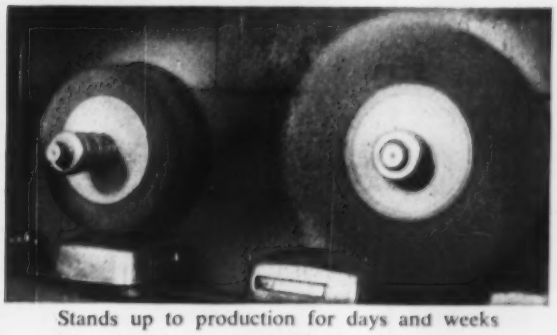
Polishing production soars with the KON-TOOR WHEEL on jobs like this aluminum stamping.

EASY TO USE



Complicated conversion factors are eliminated. The KON-TOOR WHEEL is easily adapted to standard lathes and work-holding fixtures.

IT'S WEARABLE TOO!!!



Stands up to production for days and weeks instead of hours – note wheel at left still producing after days on the job.

● For details, contact your local Behr-Manning Field Engineer, or write today to Behr-Manning, Troy, N.Y., Dept. S-7.

In Canada: Behr-Manning (Canada) Ltd., Brantford.
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BEHR-MANNING
division of NORTON Company

▲ COATED ABRASIVES
▲ SHARPENING STONES
▲ PRESSURE SENSITIVE TAPES

G-5

You name the specifications. PMS will melt to meet them

Fussy Mill for Fussy Customers

LIKE A BEAUTIFUL girl on a desert island, a steel mill in a watch factory is not something you expect to find but mighty handy to have around.

Just how handy is something the Hamilton Watch Co., Lancaster, Pa., is still finding out—to its considerable amazement. In a space no bigger than the corner bowling alley, a business in melting, forging, heat treating, rolling, slitting and wire drawing is rapidly getting bigger than its britches.

Beginning — Hamilton calls the baby mill Precision Metals Services, part of the Allied Products Division of that company. PMS was born in 1952 to produce two alloys, Dynavar and Elinvar Extra, to the precision required for watch spring use. It still has that function, but this year it will do $150,000 worth of outside business.

That's all gravy, because Hamilton's own requirements are small: One 10-lb ingot of Elinvar, drawn into a rectangular wire 0.00072 x 0.0034 in., will make 253,000 hair springs for ladies' watches. Here is the sort of equipment that keeps busy in the long intervals between watch spring melts:

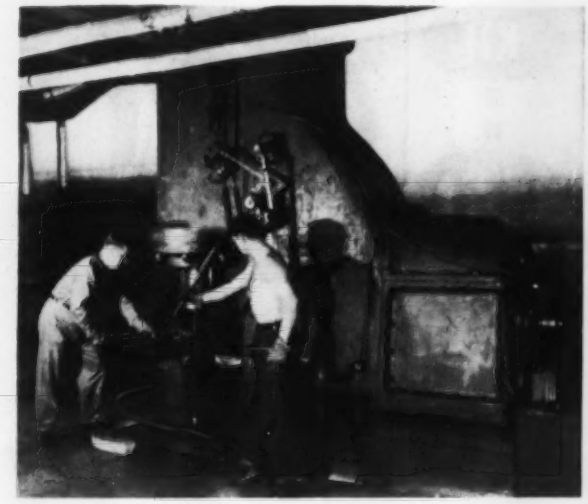
Equipment—Three high-frequency induction furnaces designed for melts from 3 to 25 lb. The charges are weighed on apothecary's scales.

A 4-in. 2-high hot rolling mill, and a cold rolling mill of the same size.

Two Sendzimir mills. One will roll 8½-in. strip to 0.001 in. with a tolerance of 0.0001-in. The other, just installed, will take strip down to 0.00015-in. The thinnest gages are rolled with wax paper backing and later degreased.

A scaled-down version of a standard strip polisher and grinder for removing oxide films and surface defects from narrow strip. Pickling is taboo in the watch factory.

A slitting mill that will slice



Who'd expect this forging hammer in a watch factory?

Laboratory size, but it handles plenty of production rolling

strip to any width between 8 and 0.04 in., and will hold tolerances to ±0.001 in.

Furnaces for billet heating, strip annealing in controlled atmospheres, heat treating and annealing in vacuum and inert atmospheres. Bright annealing to a specific temper is a specialty.

Drawing equipment that will produce wire from 0.003 to 0.187 in. Hamilton makes its own diamond dies.

A 1500-lb forging hammer. It has to be isolated on shock mountings.

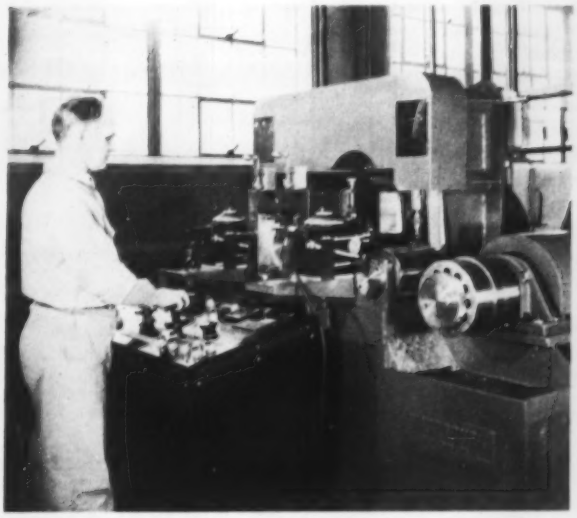
Keeping Busy—Specialized equipment such as this needs specialized business to keep it from gathering dust. A camera company wanted 5000 ft of 0.003 x 5¼-in. titanium (Ti-75A) rerolled to 0.002 in. (±0.001 in.) x 2 5/16 in. A scale company wanted a pound of 0.002 x 5/16-in. Dynavar for springs. A manufacturer of magnetic electronic shields wanted 585 lb of Hymu 80, an 80 per cent nickel-iron alloy, rerolled from 0.006 to 0.002 in., ±0.0001 in.

This was a big order, 1000 lb being about the limit PMS can handle easily without tying up equipment too long on one job. One small fork lift truck does all the handling, which helps explain why the books show orders as small as ¼-lb.

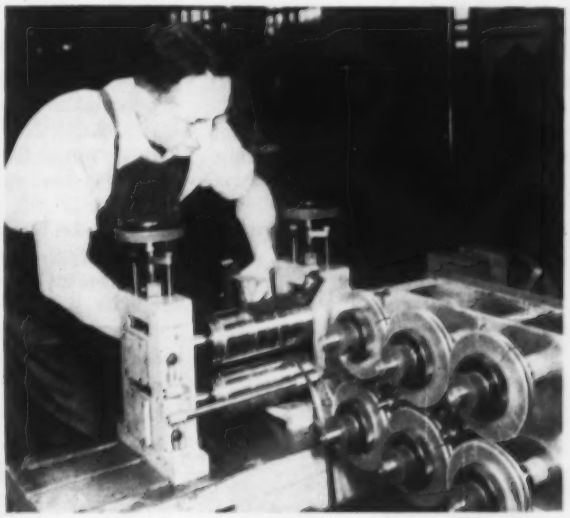
Odd Jobs—"We handle fussy requirements for fussy customers," says Chief Engineer G. R. Shurbrooks, possibly thinking of some of the jobs they have done for the AEC, or the hafnium and zirconium rolling for Foote Mineral Co.

He explains that they didn't beat the bushes for such business. Word started getting around about the equipment, and there the jobs were.

For illustration he points to touchy jobs passed on by specialty steel producers—jobs it wouldn't pay the larger mills to handle, but that are right up PMS's alley.

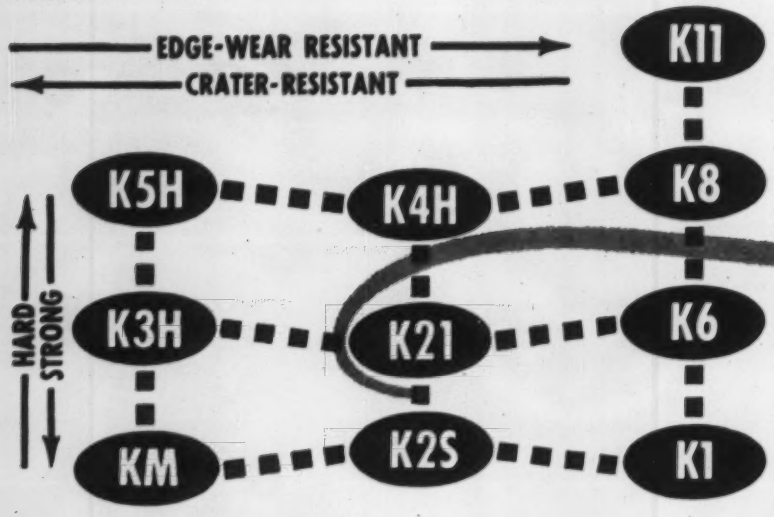


For thinness, flatness, high tolerance, two Sendzimir mills



Strip to 0.04 in. wide, ±0.001 in., comes from this slitter

(Advertisement)



Use Grade K21—the NEW Kennametal* General Purpose Steel-Cutting Grade

The Grade Selection Guide (above), which groups Kennametal grades according to strength, hardness, and wear characteristics, pinpoints the *new* K21 as a medium grade for general purpose steel-cutting applications. It is stronger than K5H, K4H, and K8. It has greater edge-wear resistance than K3H and KM, and more crater resistance than K11, K8, K6, and K1. Thus, K21 is for moderate, as well as heavy roughing of scaly, abrasive steel castings and forgings, and for interrupted cutting and milling operations requiring high resistance to edge wear, to cratering, and to shock. K21 shows exceptional performance on modern high-speed machines, and, due to its range, does an excellent job on older, slower-speed machines as well.

Because of this performance, K21 is rapidly becoming recognized as the leader of all general purpose steel-cutting grades. It's a premium grade at no extra cost. Ask your Kennametal Representative for performance facts; and for a copy of the Grade Selection Guide shown above . . . it's the most simple system of selecting the right grade for every job that has ever been developed.

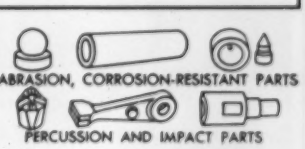
Kennametal Engineers are ready to help you

Every Kennametal Representative is a tool engineer. He is trained to help you analyze tool wear—apply the right tool and grade to the job—establish proper lathe speeds and feeds—train machinists to get increased production at the lowest possible cost with Kennametal Tools. In addition to his own broad experience, he has available to him the backgrounds of 150 other Kennametal Tool Engineers. His office is listed in the classified telephone directory in principal cities. Call him, or write KENNAMETAL INC., Latrobe, Pa.

*Registered Trademark

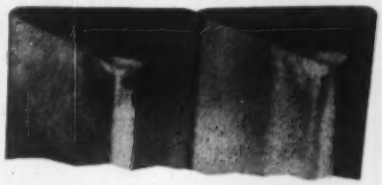
7287

INDUSTRY AND
KENNAMETAL
...Partners in Progress



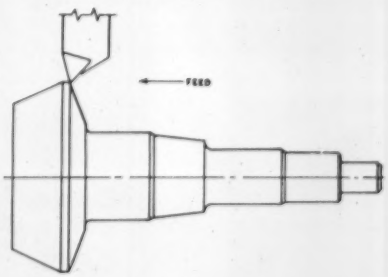
K21

Shows Exceptional Wear Resistance



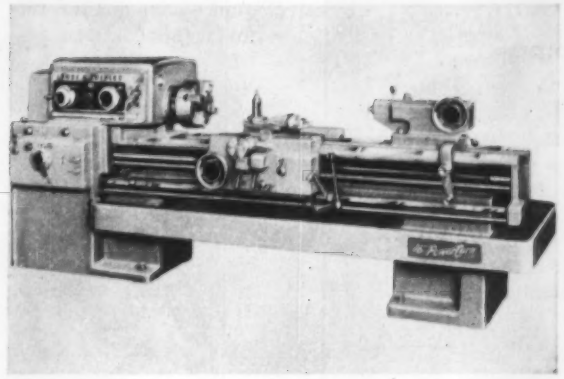
Grade K21, on the left, shows less wear than competitive grade (at right) after turning 100 pieces.

Four competitive grades of cemented carbides were used in a recent comparative test machining SAE 4620 rear axle drive pinion forgings. (See drawing below.) Each grade was removed for examination of the cutting edge after turning 100 pieces. The competitive inserts showed sufficient wear to require indexing to a new cutting edge, while the Grade K21 insert (at left above) turned 200 additional pieces before it was indexed. This 3 to 1 ratio in tool life typifies the results being obtained on many types of machining jobs with this *new* Kennametal grade, including forgings, sandy castings, centrifugal castings, plate, weldments and highly abrasive silicon steels.



VISIT US AT THE
MACHINE TOOL SHOW
Chicago, starting Sept. 6, 1955
Booths 410-411, Navy Pier, and
Booth 123, Chicago Amphitheater

Machines Redesigned for Greater Operating Convenience



Squaring Shear—The Model 0610 machine is available with fast-acting Hydro-Hold for standard shearing, or the new "no-impact" holddown system for shearing soft or highly polished metal; holddown impact damage and noise are virtually eliminated.

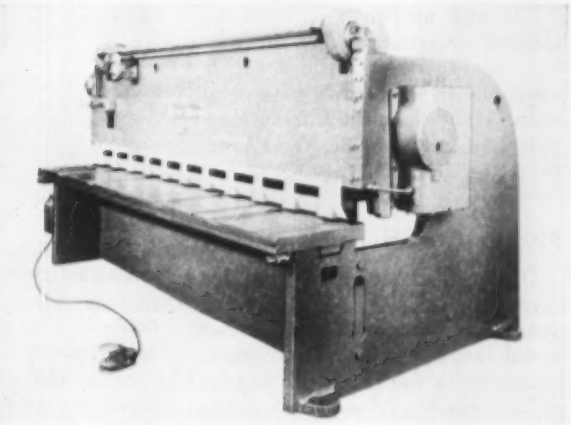
With the "no impact" system, the holddown fingers are brought down gently on the material. Holding power is developed before the blade cuts. Both systems give positive holddown, eliminating creep and assuring accurate cutting.

Other new features of the squaring shear include: Inclined-blade cutting; air counterbalances; automatic lubrication; back gage and indicator; streamlined housings and new, leakproof holddown fingers. Capacity of the shear is 3/8-in. x 10 ft. *Write:* Lodge & Shipley Co., 3055 Colerain Ave., Cincinnati 25, O. *Phone:* Kirby 1-4774

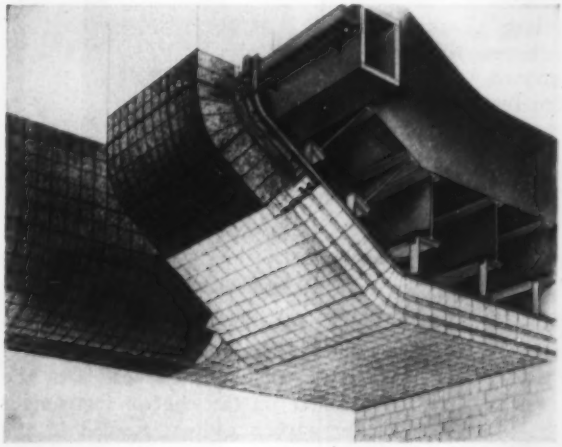
Toolmaker Lathe—The new, 16-in. Powerturn lathe is equipped with a computing head which, when two dials are set, indicates the correct settings for the three speed-shifting levers.

All controls are grouped for greatest convenience and handles are shaped for fumble-free operation. Other features include: A positive brake; a built-in horsepower ammeter; greater swing over the cross slide; a micrometer carriage dial which shows movement of the carriage in 0.005-in. increments.

The index plate for feeds and threads is tilted for greater visibility. Direct-reading crossfeed and top slide dials are graduated to 0.001 in. A square base compound rest gives minimum overhang and maximum strength.



Interchangeable Arch Takes Basic or Clay Tile



When used as fantail or chill arch in open hearth furnaces, this suspended arch will withstand 850 or more heats without repair. Basic or clay tile may be hung interchangeably on the supporting structure of steel weldments and heat-resistant castings.

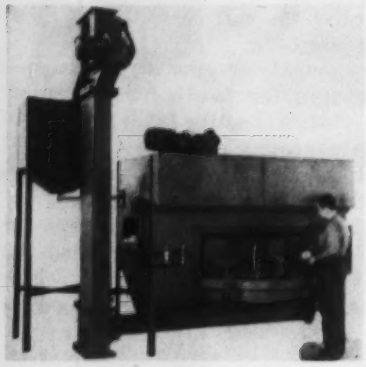
Tile installation is easy. Lug castings engage the tile on the bed joints. Heavy shelf castings prevent cumulative load. Tongues and grooves in the clay tile hold the mortar in place and provide a seal. Steel encased basic tile with corrugated steel strips in expansion joints provide room for expansion. A minimum number of tile shapes are required.

Tile is available in basic and Peerlac (60 per cent alumina) refractory in 12 and 15-in. depths. *Write:* Engineering Dept., Laclede-Christy Co. Division, H. K. Porter Company Inc., 2000 Hampton Ave., St. Louis 10, Mo. *Phone:* Mission 7-2400

NEW PRODUCTS and equipment

Blast Cabinet

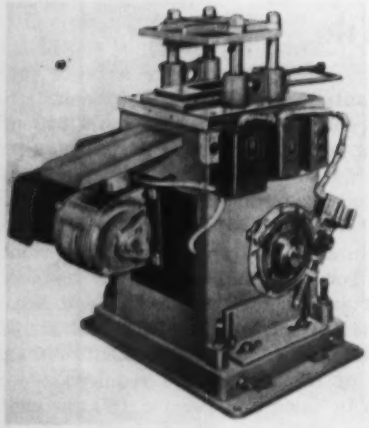
For use in grit blasting the contact surfaces of grinding wheels, the Type "MC" cabinet features easy control of indexing time, rate of rotation of work fixtures and individual blasting time of nozzles.



The unit also may be used for internal or external work on castings or other fabrications. It is available in standard or special sizes. *Write:* Macleod Co., 46 Mosteller Rd., Sharonville, O. *Phone:* Princeton 1-9560

Flying Cutoff Press

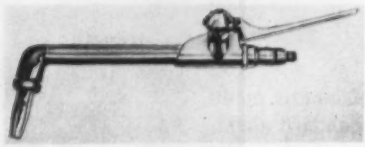
Operating at 240 or 300 rpm, this press provides accurate, high-speed production on cutoff of roll-formed metal shapes. It enables the manufacturer to use coil stock instead of cut lengths. Capacities range from 4 to 120 tons.

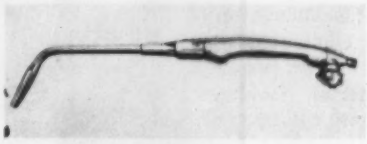


Features include: Flag trip or positive mechanical runout table; simplified adjustment of height and lateral requirement; mechanical clutch on 4-ton units and air clutch with air brake on 8 to 120-ton units. *Write:* Dahlstrom Machine Works Inc., 4225 W. Belmont Ave., Chicago 41, Ill. *Phone:* Spring 7-3670

Oxyacetylene Cutter and Welding Blowpipe

The Oxweld CW-45 cutting attachment (top photo), for use with the Oxweld W-45 Blowpipe (bottom photo), operates on acetylene pressure of 5 lb psi. It will absorb the initial surge of cutting oxygen so that "kickback" at the nozzle tip is eliminated when the cutting valve is opened suddenly.



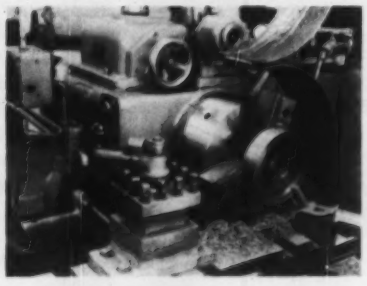


The W-45 blowpipe is a medium pressure unit. It is available with 18 welding head sizes and 8 multiflame heating heads. *Write:* Linde Air Products Co. Division, Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y. *Phone:* Murray Hill 7-8000

Air Chucks

The 6 and 8-in. chucks are designed for smaller lathes, automatics and screw machines. Hardened keyways are standard.

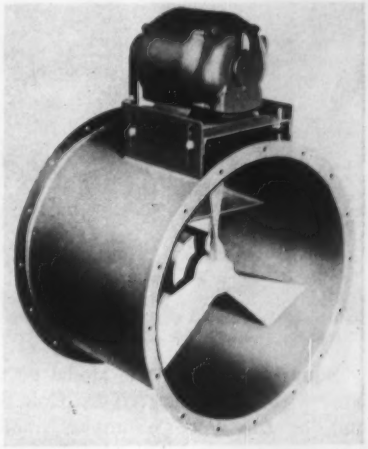
With the Ajust Tru feature the jaws can be turned in the toolroom.



The final precision adjustment is made on the machine. *Write:* Buck Tool Co., 2015 Schippers Lane, Kalamazoo, Mich. *Phone:* 2-0171

Propeller Fans

These belt-driven, tubeaxial units are designed for handling corrosive exhaust, high temperature, explosives fumes and similar difficult air-moving applications.



Designated as Type BT, the fans come in five sizes, from 16 to 36 in., and are rated to 26,000 cfm. *Write:* Robbins & Myers Inc., Springfield, O. *Phone:* 3-6461

Dew Point Controller

Here is an automatic controlling, recording and proportioning instrument to let the heat treater set

his atmosphere generator or furnace in equilibrium with any steel to be heat treated. He sets the pointer on the control instrument for carbon content needed in the

EXTRACT FROM
MARCH 21st ISSUE OF
STEEL
THE WEEKLY MAGAZINE OF METALWORKING
ourization. Output has been g
increased and refractories con-
sumption has not been unduly se-
vere.
At one open-hearth shop in the United Kingdom it is inconvenient to insert the oxygen lance from the front of the furnace. A special water-cooled gun is lowered through the center of the roof opposite the taphole. Evaporated oxygen is blown through the gun at 200 to 210 psi as soon as the bath is melted and the carbon has reached any point below about 0.40 per cent (above this level of carbon the reaction becomes violent). It is usual, depending on the condition of the bath, to feed either oxide or lime or both just before the oxygen blow commences.
Predictable Results—Operation with oxygen is so predictable that
nple is sent to the laboratory
blow begins

This describes the

P.T. OXYGEN GUN

PATENT APPLIED FOR

developed and perfected by THE STEEL COMPANY OF WALES LIMITED for use in open hearth furnaces for rapid decarburisation by jet impingement of oxygen by means of a gun centrally mounted in the furnace roof.

Ten points of advantage :—

Greatly increased rate of carbon removal
Increased production
Reduction of fuel consumption

- Push button control for entry and withdrawal
- No interference with charging
- No interference with tapping
- No reduction in life of roof and lining
- Gun life of 80 or more operations regularly obtained
- Oxygen delivery up to 60,000 cubic feet per hour or more

Proved in use

This type of gun is in regular use on eight 225 net ton furnaces in the Abbey Works Melting Shop of The Steel Company of Wales at Margam. It will also be used on the four 250 net ton furnaces now being installed.

Enquiries should be addressed to:—

The Secretary and Comptroller

THE STEEL COMPANY OF WALES LIMITED

ABBEY WORKS · PORT TALBOT
SOUTH WALES · U.K.

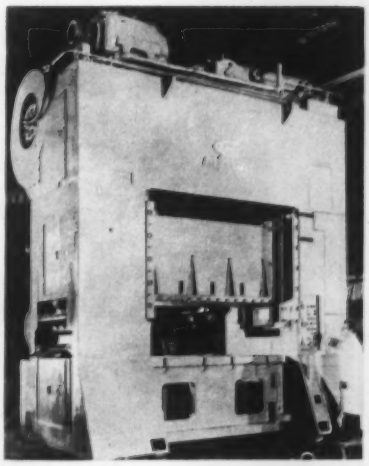
steel and the Carbotrol does the rest.

Range of control: 0.30 to 1.5 per cent carbon; 70° to −5° F dew point. The unit controls endothermic generator gases at the generator or in the furnace. *Write:* Lindberg Engineering Co., 2450 W. Hubbard St., Chicago 12, Ill. *Phone:* Monroe 6-3443

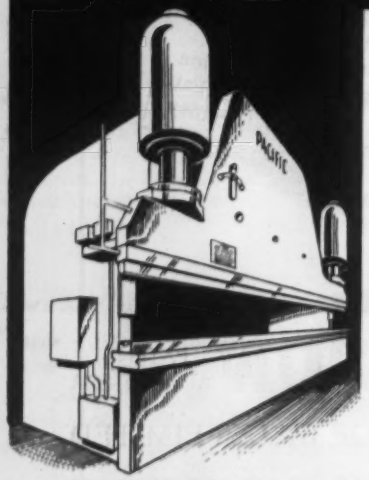
Autofeed Press

To speed operation, eliminate hazards and boost production efficiency, this press has all controls, automatic feed device and scrap cutter as integral parts of the unit. A complete production unit, the press is ready for immediate operation when set in position.

Control panels are in the press uprights and are protected against damage. The integral automatic feed device and scrap cutter simplify materials handling and keep the floor area clear. *Write:* Danly Machine Specialties Inc., 4358 W. Roosevelt Rd., Chicago 50, Ill. *Phone:* Bishop 2-1800



Versatility



Produces Profits

BENDING PUNCHING
BRAKING CORRUGATING
DRAWING BLANKING
ROLLING STRAIGHTENING

Anyone can operate it:
Can't be jammed or overloaded by inexperienced personnel.
Job can be set up quickly in any position along the bed.
Full tonnage is available at any point in the stroke.
Minimum wastage is obtained through accurate control.
Peak production is obtained by adjustment of stroke length.

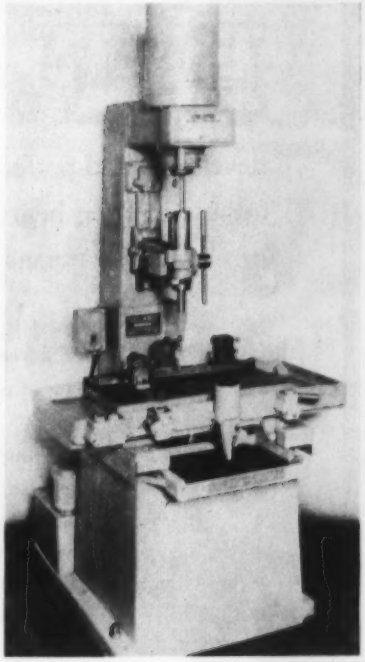
World Wide Acclaim

Famous users in many parts of the world affirm that Pacific Press Brakes have proven satisfactory, profitable, and — above all — VERSATILE.

PACIFIC INDUSTRIAL
Manufacturing Company
848 FORTY NINTH AVENUE OAKLAND, CALIFORNIA

Drilling Machine

Here is a machine with a new system for locating and drilling holes. No jigs or fixtures are needed; laying out individual workpieces is eliminated. It will produce experimental or replacement

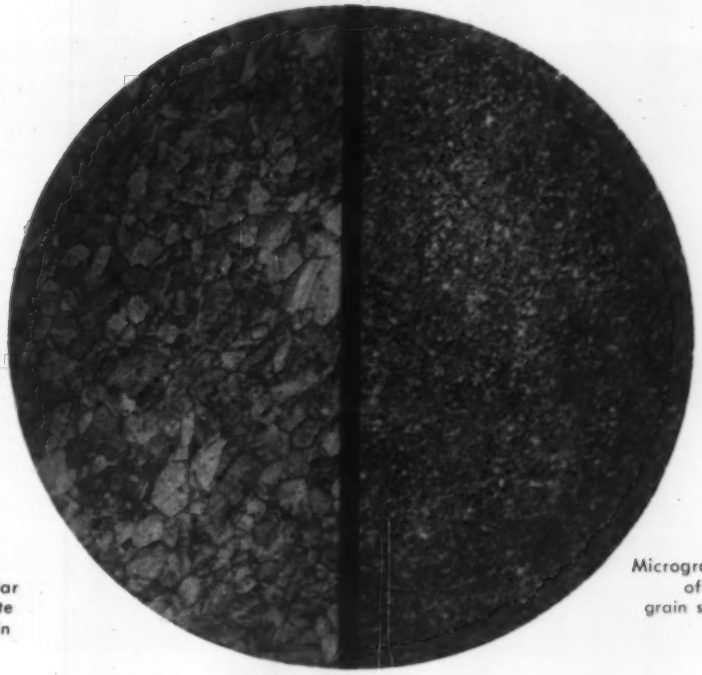


parts, small quantities of duplicate pieces or production quantities which would tie up a jig borer or other expensive machine tool.

The Hole Locator is available in

Get longer life in formed parts AT NO EXTRA COST

USE THE NEW FINE GRAIN PHOSPHOR BRONZE WITH 30% GREATER ENDURANCE LIMIT



Micrograph (75x magnification) of regular phosphor bronze. Note relatively coarse-grain structure.

Micrograph (75x magnification) of Duraflex. Its fine grain structure is the secret of its superiority.

DURAFLEX*

BY ANACONDA

DURAFLEX is a new, fine-grain phosphor bronze developed and sold only by Anaconda. Comparative fatigue tests show that the endurance limit of DURAFLEX is approximately 30% higher than for regular phosphor bronzes. In surface appearance, surface smoothness and hardness, it is superior to other phosphor bronzes. It is unsurpassed in corrosion resistance by any other phosphor bronze. Further, its formability is increased with no sacrifice in yield strength. DURAFLEX is a *premium* phosphor bronze in every way except cost; there's *no increase in price.*

If you're now using a hard-temper phosphor bronze, chances are that you can do the same forming in extra-hard temper DURAFLEX.

If you're looking for longer life in the parts you form, we'll be glad to send you a free sample of DURAFLEX. Try it, test it, and you will agree that it is superior.

5581

*Trade Mark

SEE FOR YOURSELF—

AN

ANACONDA®

PRODUCT

MADE BY THE AMERICAN BRASS COMPANY

FREE SAMPLE

The American Brass Company, Waterbury 20, Conn.

(In Canada: Anaconda American Brass Ltd., New Toronto, Ontario)

Yes, we'd like to try DURAFLEX. Please send us a free sample of

sheet in _____ **temper,** _____ **thick,**

wire in _____ **temper,** _____ **diameter.**

☐ **We'd like to talk to one of your representatives about DURAFLEX.**

NAME .....

COMPANY .....

STREET .....

CITY ..... **STATE** .....

SHEET . . . up to 0.062" thick

WIRE . . . up to 3/16" diameter (approx.)

LIFE can depend on the precision of a "thread"

Whether you are traveling through space at super-sonic speeds . . . enjoying a Sunday drive with the family . . . or harvesting the crops . . . life can depend on the precision of a thread.

Chandler, as a leading manufacturer of fasteners, specializes in precision products only. Chandler fasteners are manufactured to the highest standards of uniformity.

The spider isn't the only creature whose life depends on a thread. Because of the tremendous demands made on today's machines, Chandler pays particular attention to the threads of every fastener. In fact, Chandler specializes in thread rolling after heat treating.

CHANDLER PRODUCTS CORPORATION

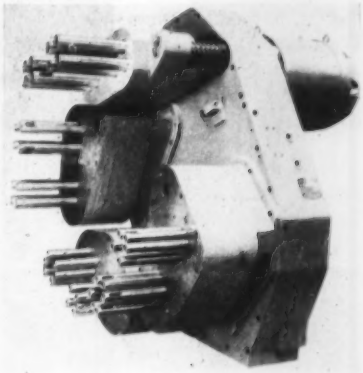
1488 Chardon Road, Cleveland 17, Ohio

NEW PRODUCTS and equipment

capacities of standard Leland-Gifford No. 2 and No. 3 machines and will perform all standard drilling operations. *Write:* Sales Dept., Leland-Gifford Co., Worcester 1, Mass. *Phone:* Pleasant 2-5635

Machine Tool Head

This 41-spindle head consists of master drive box, 11-spindle pot head for drilling, 11-spindle pot head for chamfering, 11-spindle pot head for reaming and 8-spindle individual lead screw pot head for tapping ½-in.-20 holes in steel forgings. The unit, which operates in a horizontal position, is mounted and keyed on a hydraulic slide.



The three pot heads for drilling, chamfering and reaming are driven through the master drive box by a 15-hp motor. *Write:* Dept. R, U. S. Drill Head Co., 616 Burns St., Cincinnati 4, O. *Phone:* Grandview 1-5250

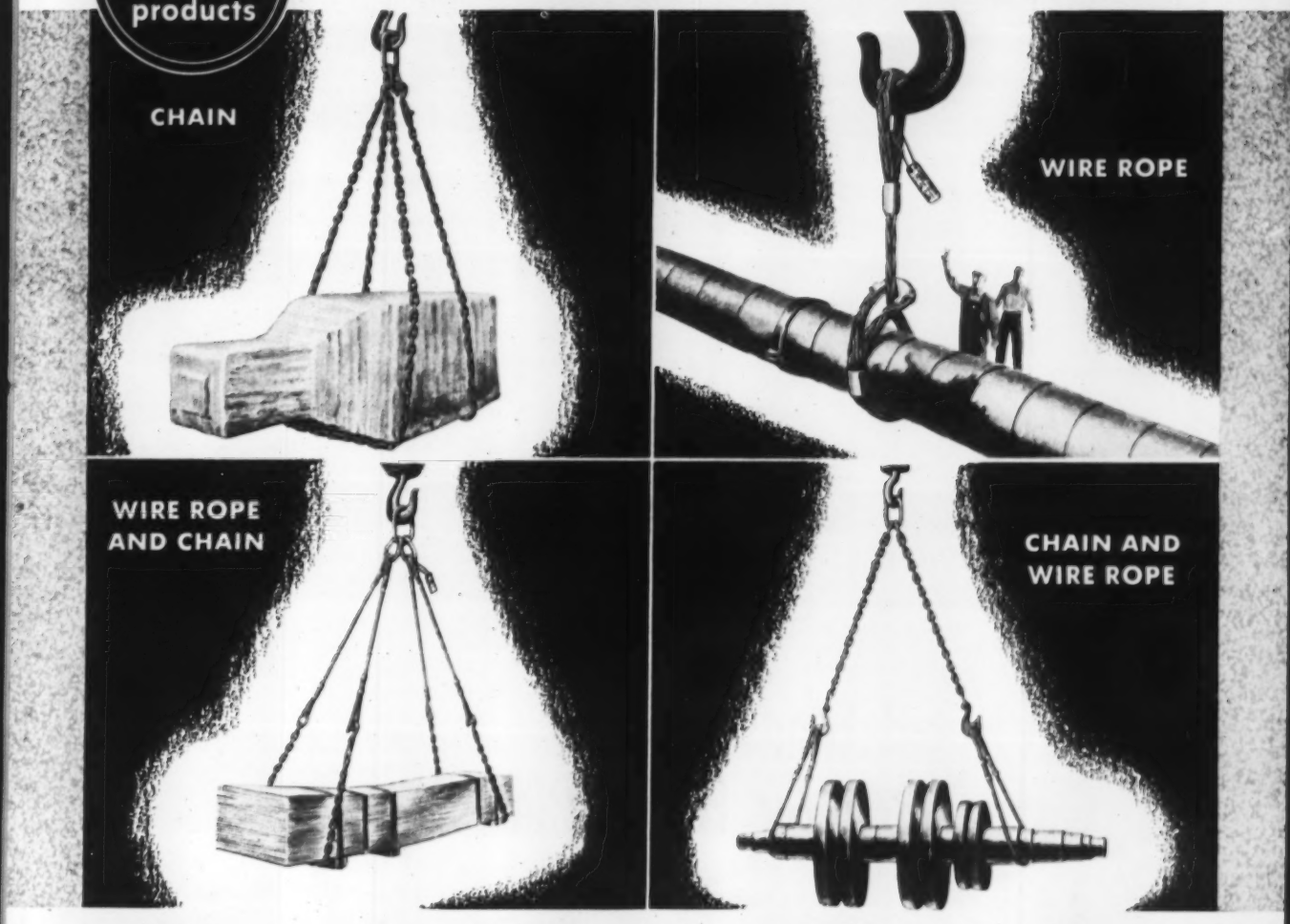
Dip Tank Magnet

This permanent magnet tool retrieves ferrous materials from all types of tanks, basins or troughs.

ACCO products

ACCO Registered* Slings–Wire Rope & Chain

THE STANDARD OF EFFICIENCY AND SAFETY



Different Loads Require Different Slings

–AND ACCO Registered* HAS THEM ALL!

• The shape or weight of a load, its temperature, protruding sharp corners—all these and other factors should influence the choice of a sling for any particular job. On some jobs chain slings are best. In others the characteristics of wire rope make it the first choice. And in still other cases a combination of wire rope slings and chain slings will provide the greatest lifting efficiency.

The safest slings available

Each component of an ACCO *Registered** Sling is made from the best materials procurable for its use. Each part is first individually tested—it must prove to have strength equal to or greater than the sling body. All hooks for ACCO *Registered** Slings are also Magnaflux tested. Then these components are assembled into slings according to carefully engineered designs that have proved themselves in rigorous field tests.

The completed sling is then individually proof-tested to twice the working load limit. Then and only then, is it awarded the coveted ACCO Registration certificate and the ring or the tag as the case may be.

Compare this quality control, precise manufacturing, and proof testing with the necessarily hit-or-miss methods used in producing "home made" or hand assembled slings. You'll see why ACCO *Registered** Slings are safer.

And ACCO *Registered** Slings cost less in the long run. Their precision design and manufacture insure longer life—cut your overall lifting costs. Your ACCO Representative has the facts. If you don't know who he is, please write our office at Bridgeport, Conn.

**Trade Mark Registered*

Write our Bridgeport Office for helpful literature

ACCO

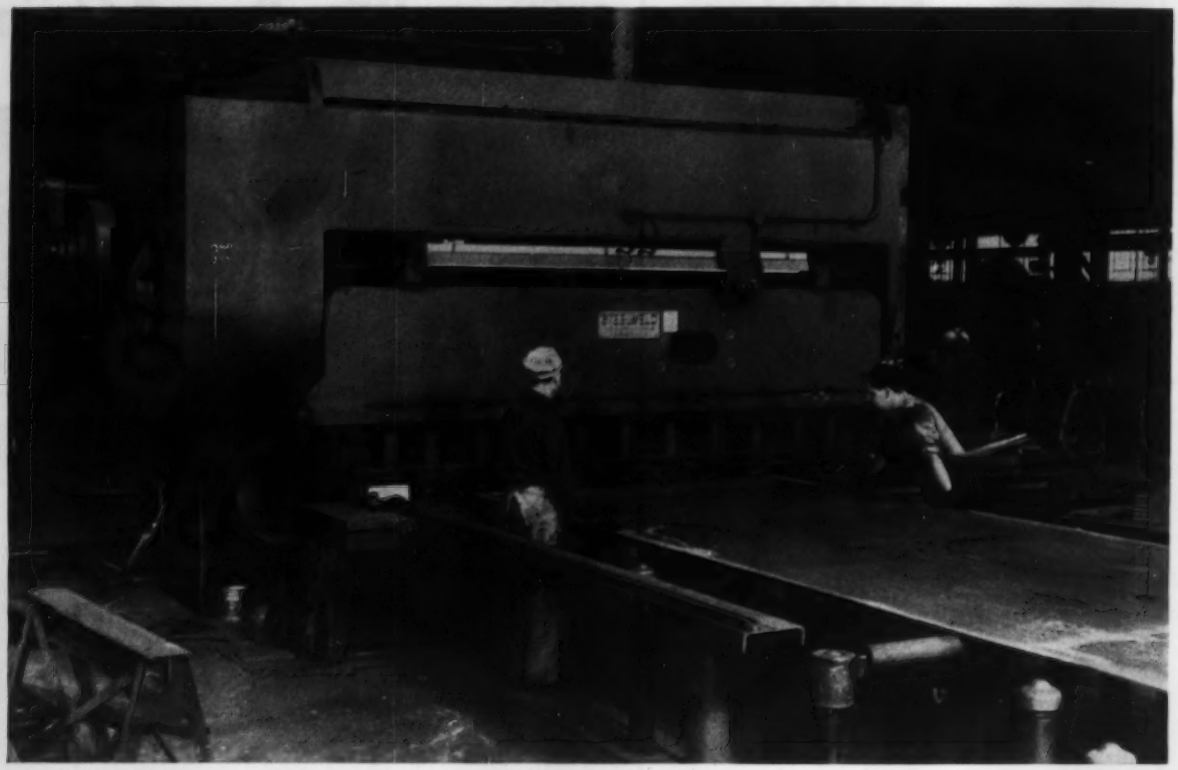
TRADE MARK

AMERICAN CHAIN & CABLE

BRIDGEPORT, CONN.

Atlanta, Boston, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Wilkes-Barre, Pa., York, Pa.
In Canada: Dominion Chain Co., Ltd., Niagara Falls, Ont.

for Better Value



Steel plates up to 10' x 1" are quickly cut on this Steelweld. A complete line of machines is available for every thickness from light gauge to 1½" and every length from 6'-0" to 24'-0".

Pivoted-Blade Shears Outstanding for Heavy Plates

WHILE Steelweld Shears are used in hundreds of plants for cutting every gauge of metal, it is on heavy plate where the easy accurate cutting action of the machine is really eye catching. With nothing more than a quick "oomph" the knife goes through the metal quickly and cleanly, seemingly without effort. The resulting cut edges are straight and sharp.

Steelweld Shears are now cutting steel up to 1½ inches thick. A wonderful feature is the ease and speed with which the heavy plate machines can be adjusted to cut the lightest gauge metal. In a matter of seconds the clearance between the knives can be reduced to that known to provide the best result for the thickness of the plate being cut. This is done simply by turning a crank until a gauge indicator is on the correct thickness figure. This feature is known as MICRO-SET knife adjustment and is the talk of the industry.

Production is fast on Steelwelds because they are heavily built to enable high operating speeds. Also, they are equipped with electric foot control. This reduces operator fatigue and often eliminates many steps he must take to the machine.

If you want the most modern machine, with outstanding features that make for the finest in all around performance — tried and proven features, some of which are not obtainable in any other shear — we invite you to get the facts on Steelwelds.

GET THIS BOOK!

CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

7847 East 282nd Street, Wickliffe, Ohio

STEELWELD PIVOTED BLADE SHEARS

NEW PRODUCTS and equipment

It is particularly useful where hot liquids or corrosive acids are involved. The magnet will lift and hold metallic objects weighing 75 to 100 lb.

The Alnico V magnetic element is encased in three stainless steel tubes. They are mounted on nonmagnetic runners to allow the tool to be swept across the bottom of the tank and yet not attach itself to the tank. *Write*: Eriez Mfg. Co., Erie, Pa. *Phone*: 4-0133

Fork Truck

The "Balanced Design" concept of this 6000-lb, gasoline-powered truck gives more effective operation and longer low-maintenance life. Known as the Model FG-60, it has 144-in. maximum lift and 85½-in. turning radius.

Power unit is a heavy-duty, six-cylinder industrial engine. The truck has two speeds forward and two in reverse, with top full-load travel speed of 7 mph. *Write*: Baker-Raulang Co., 1250 W. 80th St., Cleveland, O. *Phone*: Olympic 1-3000

High-Pressure Hose

Flexsteel wire-reinforced hydraulic control hose is designed specifically for the expanding hydraulic equipment industry.

It is available in sizes from 3/16 to 2 in. in diameter. Depending on size, the hose handles pressures up to 5500 psi. *Write:* Industrial Products Division, Goodyear Tire & Rubber Co., Akron 16, O. *Phone:* Franklin 6-1411.

35% NICKEL

DURALOY

15% CHROMIUM

Furnace Castings

Here are two good examples of our work in high-nickel castings!

These are in the Duraloy HT group calling for Ni 33.37 percent. We've gone as high as 68% nickel on some castings where extremely high temperatures and very severe corrosive conditions had to be resisted. The important factor concerning castings for exceptionally high temperatures is that they must retain their structural form under load.

Knowing just how much nickel to put in and how much chromium and other alloying elements depends to a large extent on experience . . . and it is experience that we can offer you for the castings you need. We've been producing static castings since 1922 and centrifugal castings since 1933, being among the pioneer founders in each class.

If you would care to have our metallurgist study your casting problem, we shall be glad to have you call upon us for the service.

Our New General Catalog is yours for the asking.

THE DURALOY COMPANY

OFFICE AND PLANT: Scottdale, Pa.
EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.
CHICAGO OFFICE: 332 South Michigan Avenue

NEW literature

Write directly to the company for a copy

Turret Punch Press

The R-61, heavy-duty machine combines the speed of a punch press with the versatility of turret tooling—bulletin 61, 16 pages. Dept. 161, Wiedemann Machine Co., P. O. Box 6794, 4272 Wissahickon Ave., Philadelphia 32, Pa.

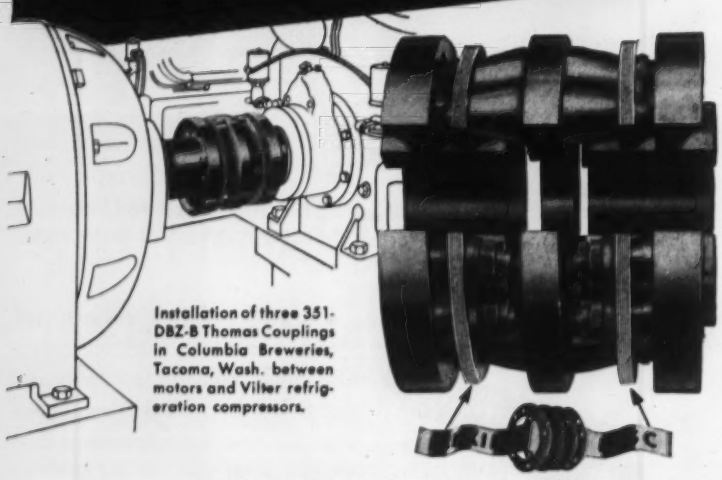
Electrode Selector Guide

Arcaloy designations, electrode data and application data for 22 of the must popular stainless steel electrodes in the Arcaloy line are listed—bulletin AR-10, 4 pages. Dept. 05, Alloy Rods Co., Lincoln Highway West, York, Pa.

Arc Furnace Transformers

Here is a comprehensive guide to assist arc furnace users prepare specifications for transformers which will best serve their needs—bulletin GEA-6236, 12 pages. General Electric Co., Schenectady 5, N. Y.

THOMAS FLEXIBLE COUPLINGS...
for more years of better service!

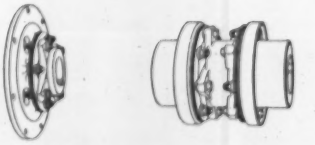


Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash. between motors and Vilter refrigeration compressors.

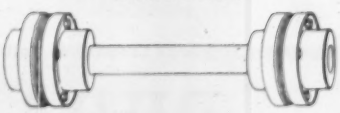
Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention, Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



THOMAS COUPLINGS ARE MADE FOR A WIDE RANGE OF SPEEDS, HORSEPOWER AND SHAFT SIZES.



Write for our new Engineering Catalog No. 51A

THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.

V-Belt Catalog

The complete line of Mor-Grip fractional-horsepower and heavy-duty, multiple V-belt drive belts are described—catalog V-55, 24 pages. Maurey Mfg. Corp., 2907-23 S. Wabash Ave., Chicago 16, Ill.

Air Conditioning Units

A new line of central-station, cabinet-type units, in capacities from 600 to 48,000 cfm, is described—bulletin 8127, 20 pages. American Blower Corp., Detroit 32, Mich.

Roll Thread Snap Gages

They combine "go" and "no go" elements in a single, low-cost gage for external thread inspection—circular 585, 12 pages. Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford 1, Conn.

Three-Phase Spot Welder

Described is the PMCO 2 ST air operated, press type welder — bulletin 334-3, 8 pages. Dept. L-2, Sciaky Bros. Inc., 4915 W. 67th St., Chicago, Ill.

Firebrick Data Book

"B&W Firebrick" discusses properties of Allmul, Allmul-D, 80, 80-D and Junior Firebrick and lists typical furnace applications—bulletin R-34, 28 pages. Refractories Division, Babcock & Wilcox Co., 161 E. 42nd St., New York 17, N. Y.

Titanium Alloy Data

Here is the metallurgy and chemistry, properties, recommended heat treatment, forging and welding procedures of MST 6A1-4V titanium alloy—4 pages. Mallory-Sharon Titanium Corp., Niles, O.

Heat Treating Data Book

"How to Plan Your Toolroom Heat Treating Department" is a practical guide to assist those planning new, enlarged or redesigned heat treating departments—24 pages. Furnace Division, Lindberg Engineering Co., 2444 W. Hubbard St., Chicago 12, Ill.

Precision Cleaning, Finishing

The first issue of this quarterly brochure is devoted to the wet abrasive blast cleaning process. American Wheelabrator & Equipment Corp., 1157 S. Byrkit St., Mishawaka, Ind.

Flexible Hose Bulletins

Cover design and installation of flexible hose for use in dust and fume control, air conditioning and materials handling—bulletins 40, 41, 42, 43, 44 and price lists. Flexaust Co. Division, Callahan Zinc-Lead Co. Inc., 100 Park Ave., New York 17, N. Y.

NEW LITERATURE

Storage Equipment

More than 120 models of racks, bins, shelves and pallet frames are listed in 16-page catalog 702. Frick-Gallagher Mfg. Co., 110 S. Michigan Ave., Wellston, O.

Machine, Vehicle Levers

Sixteen-page bulletin presents the complete Batavia line of levers and control units—bulletin HW-B3. Batavia Metal Products Corp., Batavia, N. Y.

Needle Bearing Catalog

Organized and coded to speed bearing selection, 76-page catalog presents all pertinent information and enables engineers to easily ascertain the bearing which best meets installation requirements—catalog 55. Torrington Co., Torrington, Conn.

Publication List

Sixteen-page folder lists all of this company's current technical data sheets and booklets—5th edition. Advertising Dept., Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22, Pa.

Lubricated Plug Valves

This 28-page catalog shows straightway, 3-way, 4-way and multiple-port lubricated plug valves for 250-lb oil-water-gas and 150-lb steam working pressure — reference book 39-5. Homestead Valve Mfg. Co., Coraopolis, Pa.

Truck Scales

This expanded line of truck scales, ranging from 60-ft platform sizes down to axle load types, is illustrated and described—form 2417a, 8 pages. Toledo Scale Co., Toledo 1, O.

Glass Mold Casting

Glascast, a fast, economical method for precision casting of metals by using glass molds, is described—bulletin GC-1. Refractories Sales Dept., Corning Glass Works, Corning, N. Y.

Inventory Control

"Inventory Control for Manufacturers" describes the essentials of good inventory control—bulletin KD-406, 16 pages. Remington Rand Inc., 315 Fourth Ave., New York 10, N. Y.

Ultrahigh Strength Steels

This symposium (six papers) discusses a new nickel alloy steel capable of providing tensile strengths up to 300,000 psi in aircraft applications—76 pages. Reader Service Station, International Nickel Co., 67 Wall St., New York 5, N. Y.

Blast Cleaning Equipment

Described are Hydro-Finish blast cleaning equipment, bulletin 1403, 8 pages; and the type CW-1, centrifugal wet dust collector, bulletin 919, 4 pages. Pangborn Corp., P. O. Box 380, Hagerstown, Md.

Basic Steel Products Guide

Here is a buyers' guide to bars, structurals, plates, sheets and strip—bulletin 11-2, 4 pages. Joseph T. Ryerson & Son Inc., Box 8000-A, Chicago 80, Ill.

Corrosion-Resistant Tubing

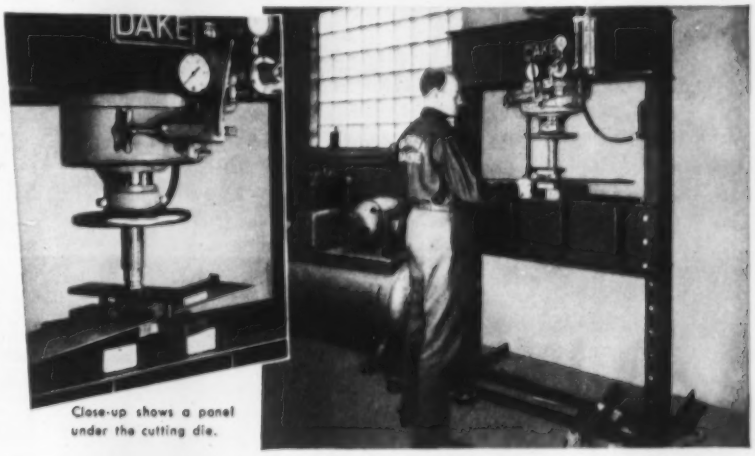
Nickel-molybdenum and nickel-molybdenum-chromium alloy tubing and pipe are described—4 pages. Alloy Tube Division, Carpenter Steel Co., Union, N. J.

Buckets and Grapples

Specifications, table of sizes and on-the-job photos of clamshells and grapples handling garbage and refuse are given—bulletin 2350-R, 24 pages. Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh, Pa.

Used his head, a $100 die, and a DAKE Hydraulic Press

to reduce cost of cutting job from 88¢ to 9¢ a panel



Close-up shows a panel under the cutting die.

Jerry Denicola of the Marmora Machine Co., Chicago, believes in using his head to make money. The ways in which he uses his Dake Press should be an inspiration to other machinists.

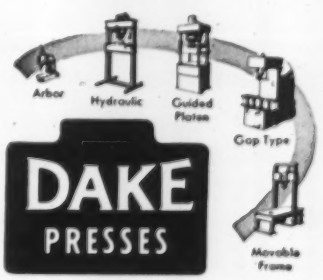
One of his customers makes flame-cutting machines, for which Jerry furnishes steel panels in which an opening must be cut exactly to 1¾" x 2¾" size.

This job was formerly end-milled, and the corners filed square—a job that required a skilled mechanic. Fifty panels cut this way required 7½ hours labor at $2.35 an hour, $17.62 for the run, or 88¢ a panel.

So Jerry made a hardened die at a cost of about $100, and put the job on his Dake Press. Now a run of 50 panels can be cut in 3 hours by a semiskilled mechanic at a cost of $1.50 an hour—$4.50 for the run, or only 9¢ a panel. So every time an order for fifty more panels recurs, there's an extra profit of $13.12 in it!

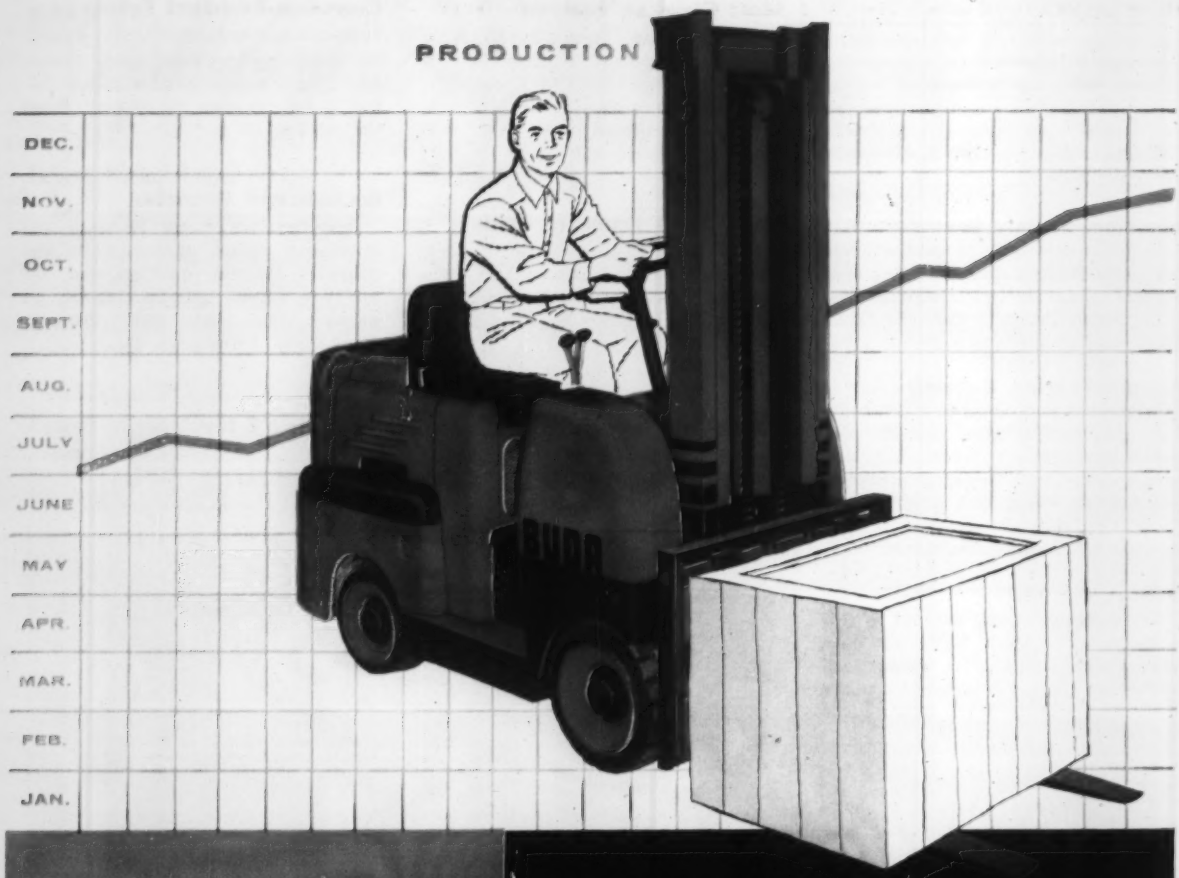
You, too, can make an extra profit with a Dake Press . . . see your Dake distributor.

Dake Corporation,
640 Seventh St., Grand Haven, Mich.



Send for Big New Catalog

DAKE CORPORATION
640 Seventh St., Grand Haven, Mich.
Please send me a copy of Dake Catalog No. 129
Name_____
Company_____
Address_____
City_____ Zone____ State_____



BUDA

IS THE FORK LIFT TRUCK THAT GIVES LONGEST TROUBLE-FREE SERVICE – LESS DOWNTIME

PUT YOURSELF IN THE DRIVER'S SEAT
with this Free facts book. 36 pages, illustrated in color, packed with lift truck information. Write today for your copy.

BUDA Lift Truck—toughest in the field! Buda will give you more trouble-free service than any other lift truck made. Buda Lift Trucks are still carrying more than their share of the production load long after others have been "traded in". And, you don't waste money on downtime with Buda. When something goes wrong with Buda you can count on a 22-second strip for service, a 22-minute strip for overhaul, a 30-minute clutch change. What's more . . . all parts for Buda lift trucks are 85% interchangeable. Now is the time to look into Buda Fork Lift Trucks. When you step into a Buda, you've taken the first step to less downtime, less handling cost and increased production.

THE BUDA DIVISION
Allis-Chalmers Manufacturing Company
Harvey, Illinois

STEEL

July 18, 1955

Market Outlook

THE STEEL INDUSTRY didn't price itself out of the market.

Its price increases the first of this month were steeper than most people expected but the advances aren't hurting demand. Consumer complaints about the steel price increase are noticeably absent. Here are four reasons why: 1. Steel consumers' business is good; they need steel. 2. The brief work stoppage, the Fourth of July holiday and summer vacations have slowed the flow of steel to consumers. 3. Consumers were resigned to a steel price increase. 4. Consumers will pass on as much of the increase as they can.

DILEMMA—Although there is an absence of audible complaints, some buyers are trying to figure where the steel price increase leaves them. Some steel users lowered their product prices in June. Among them were fabricators of gutters and downspouts.

CAUGHT— A $7-a-ton increase on structural shapes catches some fabricating shops uncovered on plain material for firm contracts taken at low prices. In addition, these shops will face an estimated increase of $5 a ton in labor. These increases will hurt, for some fabricators were already on narrow margins of profit.

DANGER—Their alternative is to take the risk of raising prices. Higher prices on fabricated steel may delay, if not kill, some work under consideration. This is particularly true of some public works projects planned under limited appropriations.

But there's no noticeable downturn yet because of higher steel prices, and mills are grappling with arrearages. Some are holding back on opening of order books to leave room for getting up to date on deliveries, and others are turning away orders. Among those being turned away are freight car builders, whose business is just now on the upgrade.

GAINING—The heavy bookings prompted the mills to continue their recovery from the brief steel strike and the Fourth of July holiday. In the week ended July 17, the national ingot rate rose 3.5 points to 93 per cent of capacity. This is only 4 points below this year's high point.

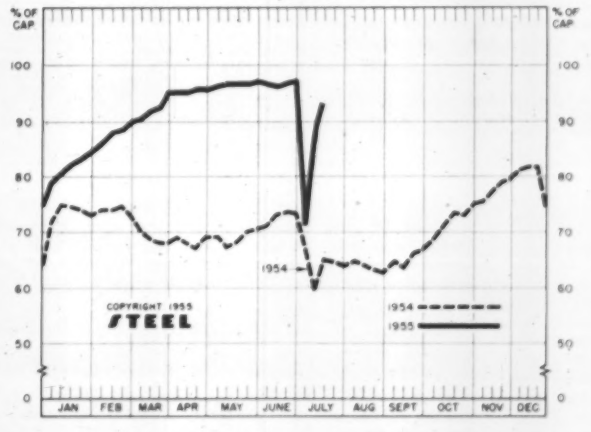
PLAYING A HUNCH—The high rate of steel production is influencing some buyers who have been amplifying their supplies through warehouse acquisitions to hold up on these orders. They think they will be able to get more steel directly from the mills, where the price is lower than it is at the warehouse.

PRICE TRENDS—High production of steel, higher steel prices and exports of scrap gave steel scrap prices another upward nudge. This put STEEL's price composite on steelmaking scrap at $38.67 a gross ton, an 84-cent rise over the preceding week.

A $2.50 rise per gross ton pushed STEEL's price composites on pig iron to the following: Basic, $58.54; No. 2 foundry, $59.04; and malleable, $59.77. This is the first rise in pig iron prices since mid-1953.

STEEL's price composite on finished steel holds to the level attained in the preceding week, $125.64 a net ton, $7.19 higher than it was before the steel price rise.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended July 17	Change	Same Week 1954	Same Week 1953
Pittsburgh	94	+ 3*	63.5	96
Chicago	96	+ 4*	70	98.5
Mid-Atlantic	95	+ 6*	59	97.5
Youngstown	98	0	64	105
Wheeling	94.5	— 0.5	75	98
Cleveland	101	+ 7*	66.5	101.5
Buffalo	105	+ 5	91	106.5
Birmingham	93.5	0	75	101
New England	80	+ 7	48	45
Cincinnati	87	+32.5	49.5	98
St. Louis	92	— 6.5	55.5	95.5
Detroit	88	— 7	53.5	108
Western	100	— 1	79	100
National Rate	93	+ 3.5	65	96

INGOT PRODUCTION‡

	Week Ended July 17	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	139.0†	129.0	144.2	95.5
NET TONS (In thousands)	2,233†	2,073	2,316	1,534

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Metalworking Outlook—p. 47

Technical Outlook—p. 103

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	July 12 1955	July 5 1955	Month Ago	June Average
(1947-1949=100)	153.9	144.9	144.8	144.8

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended July 12

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.800	Sheets, Electrical	$10.200
Rails, Light, 40 lb	6.217	Strip, C.R., Carbon	8.136
Tie Plates	5.625	Strip, C.R., Stainless, 430 (lb)	0.444
Axles, Railway	8.000	Strip, H.R., Carbon	5.350
Wheels, Freight Car, 33 in. (per wheel)	51.167	Pipe, Black, Buttweld (100 ft)	16.366
Plates, Carbon	4.950	Pipe, Galv., Buttweld (100 ft)	19.971
Structural Shapes	4.867	Pipe, Line (100 ft)	158.925
Bars, Tool Steel, Carbon (lb)	0.430	Casing, Oil Well, Carbon (100 ft)	165.120
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.525	Casing, Oil Well, Alloy (100 ft)	244.670
Bars, Tool Steel, H.R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115	Tubes, Boiler (100 ft)	39.470
Bars, Tool Steel, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.610	Tubing, Mechanical, Carbon	20.980
Bars, H.R., Alloy	9.375	Tubing, Mechanical, Stainless, 304 (100 ft)	178.957
Bars, H.R., Stainless, 303 (lb)	0.450	Tin Plate, Hot-dipped, 1.25 lb	8.533
Bars, H.R., Carbon	5.350	Tin Plate, Electrolytic, 0.25 lb	7.233
Bars, Reinforcing	5.313	Black Plate, Canmaking Quality	6.333
Bars, C.F., Carbon	8.660	Wire, Drawn, Carbon	8.575
Bars, C.F., Alloy	12.175	Wire, Drawn, Stainless, 430 (lb)	0.578
Bars, C.F., Stainless, 302 (lb)	0.468	Bale Ties (bundle)	6.473
Sheets, H.R., Carbon	5.145	Nails, Wire, 8d Common	8.615
Sheets, C.R., Carbon	6.239	Wire, Barbed (80-rod spool)	7.847
Sheets, Galvanized	7.690	Woven Wire Fence (20-rod roll)	18.635
Sheets, C.R., Stainless, 302 (lb)	0.588		

STEEL's FINISHED STEEL PRICE INDEX*

	July 13 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	207.76†	207.76†	194.53	195.87	156.69
Index in cents per lb	5.628†	5.628†	5.270	5.306	4.245

†Preliminary

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$125.64†	$125.64†	$118.46	$117.43	$94.36
No. 2 Fdry, Pig Iron, GT	59.04†	56.54	56.54	56.54	46.47
Basic Pig Iron, GT	58.54†	56.04	56.04	56.04	45.97
Malleable Pig Iron, GT	59.77†	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	38.67	37.83	35.00	27.33	36.75

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.
†Preliminary

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	July 13 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.65	4.30	4.30	4.30	3.45
Bars, H.R., Chicago	4.65	4.30	4.30	4.30	3.45
Bars, H.R., deld. Philadelphia	4.90	4.55	4.55	4.55	3.93
Bars, C.F., Pittsburgh	5.90	5.40	5.40	5.40	4.10-4.15
Shapes, Std., Pittsburgh	4.60	4.25	4.25	4.25	3.40
Shapes, Std., Chicago	4.60	4.25	4.25	4.25	3.40
Shapes, deld., Philadelphia	4.88	4.53	4.53	4.53	3.42
Plates, Pittsburgh	4.50	4.225	4.225	4.225	3.50
Plates, Chicago	4.50	4.225	4.225	4.225	3.50
Plates, Coatesville, Pa.	4.50	4.225	4.225	4.225	3.60
Plates, Sparrows Point, Md.	4.50	4.225	4.225	4.225	3.50
Plates, Claymont, Del.	4.50	4.225	4.225	4.225	3.60
Sheets, H.R., Pittsburgh	4.325	4.05	4.05	4.05	3.25
Sheets, H.R., Chicago	4.325	4.05	4.05	4.05	3.35
Sheets, C.R., Pittsburgh	5.325	4.95	4.95	4.95	4.10
Sheets, C.R., Chicago	5.325	4.95	4.95	4.95	4.10
Sheets, C.R., Detroit	5.425	5.10	5.10	5.10	4.30
Sheets, Galv., Pittsburgh	5.85	5.45	5.45	5.45	4.40
Strip, H.R., Pittsburgh	4.325	4.05	4.05	4.425	3.25-3.50
Strip, H.R., Chicago	4.325	4.05	4.05	4.05	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.75	4.15-4.50
Strip, C.R., Chicago	6.45-6.55	5.85	5.85	6.00	4.30
Strip, C.R., Detroit	5.85-6.55	5.85	5.85	5.60-5.90	4.35-4.95
Wire, Basic, Pittsburgh	6.25	5.75	5.75	5.75	4.50
Nails, Wire, Pittsburgh	7.60	6.85	6.85	6.85	5.30
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.50
SEMIFINISHED STEEL					
Billets, Forging, Pitts. (NT)	$84.50	$78.00	$78.00	$78.00	$63.00
Wire Rods, 7/32-½" Pitts.	5.025	4.675	4.675	4.525	3.85
PIG IRON, Gross Ton					
Bessemer, Pitts.	$59.50	$57.00	$57.00	$57.00	$47.00
Basic, Valley	58.50	56.00	56.00	56.00	46.00
Basic, deld. Phila.	62.16	59.66	59.66	59.66	49.44
No. 2 Fdry, Pitts.	59.00	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	59.00	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	59.00	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	62.66	55.16	55.16	60.16	49.94
No. 2 Fdry, Birm.	54.50	52.88	52.88	52.88	42.38
No. 2 Fdry (Birm.) deld. Cin.	62.20	60.58	60.58	60.43	49.08
Malleable, Valley	59.00	56.50	56.50	56.50	46.50
Malleable, Chicago	59.00	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$39.50	$38.50	$34.50	$28.50	$40.00
No. 1 Heavy Melt, E. Pa.	39.50	39.00	36.50	24.00	33.00
No. 1 Heavy Melt, Chicago	37.00	36.00	34.00	30.00	37.25
No. 1 Heavy Melt, Valley	38.50	37.50	34.50	26.50	40.75
No. 1 Heavy Melt, Cleve.	35.00	35.00	31.50	24.50	38.50
No. 1 Heavy Melt, Buffalo	34.50	29.50	29.50	25.50	36.75
Rails, Rerolling, Chicago	57.00	55.50	51.50	43.50	48.50
No. 1 Cast, Chicago	43.50	43.50	41.50	35.50	44.50
COKE, Net Ton					
Beehive, Furn, Connisvl.	$13.75	$13.75	$13.75	$14.75	$14.25
Beehive, Fdry, Connisvl.	16.75	16.75	16.75	16.75	15.50
Oven, Fdry, Chcago	24.50	24.50	24.50	24.50	21.00

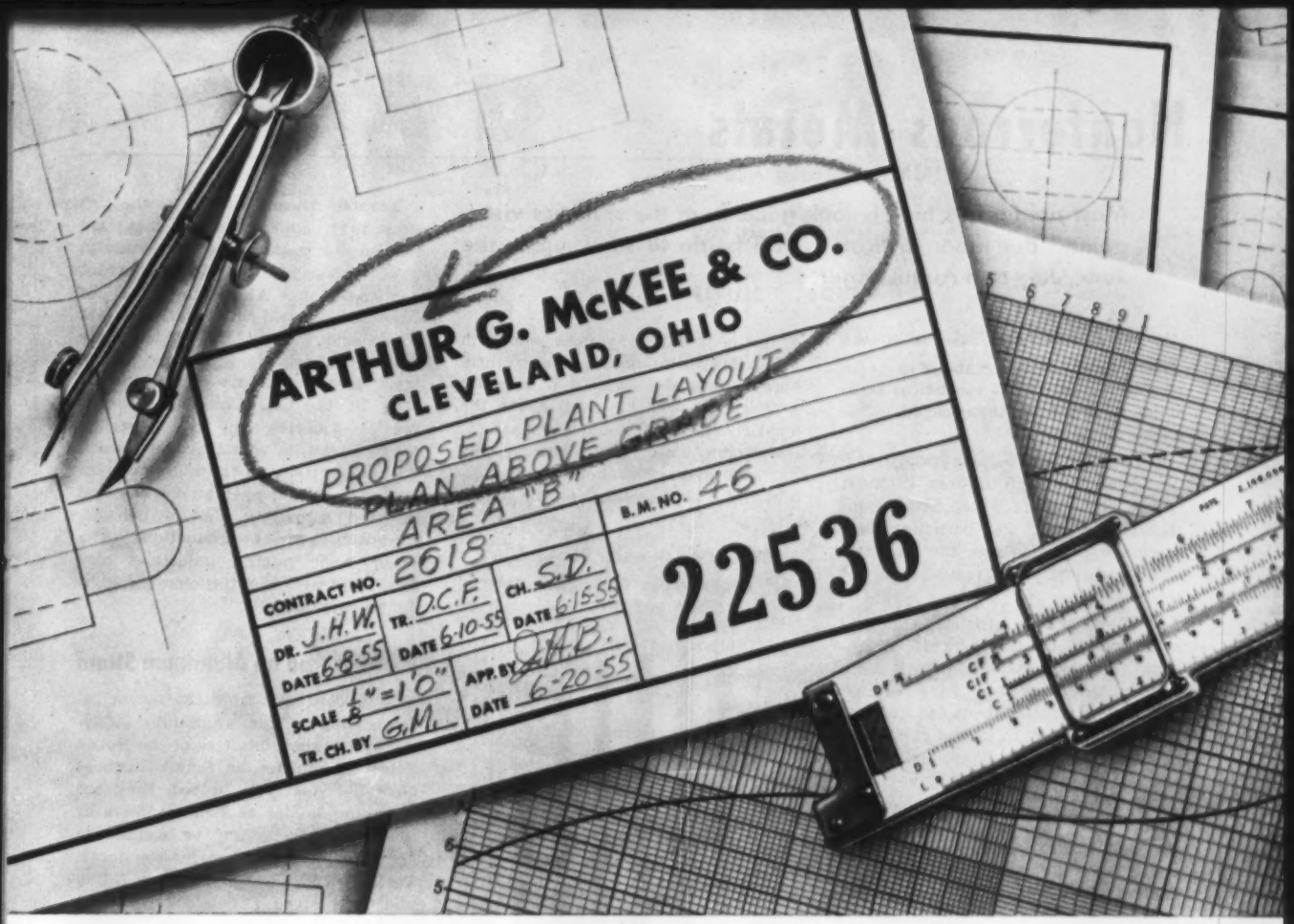
Daily Nonferrous Price Record

	Price July 13	Last Change	Previous Price	June Avg.	May Avg.	July 1954 Avg.
Copper	36.00	Mar. 29, 1955	33.00	36.000	36.000	30.000
Lead	14.80	Oct. 4, 1954	14.55	14.800	14.800	13.800
Zinc	12.50	June 16, 1955	12.00	12.250	12.000	11.000
Tin	96.50	July 13, 1955	95.875	93.668	91.410	96.558
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	60.000
Aluminum	23.20	Jan. 12, 1955	22.20	23.200	23.200	21.500
Magnesium	28.50	Mar. 21, 1955	27.00	28.500	28.500	27.000

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99+%, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.**
  Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.**
  Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.**
  Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.**
  Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**



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Nonferrous Metals

Most nonferrous metals look good from the statistics viewpoint. But labor difficulties will begin to show up in the June, July and August figures

Nonferrous Metal Prices, Pages 148 & 149

THE NONFERROUS industry is in one of the strongest statistical positions it has ever experienced. One exception is copper.

Production and shipments are well ahead of year-ago figures in most cases, and the business climate indicates the gains may be maintained, maybe multiplied, over the last half of the year if labor troubles do not interfere.

Zinc—Slab zinc producers shipped more metal in June—90,915 tons—than they had for any month since March, 1945, resulting in a further decrease of stocks to 48,612 tons at the beginning of July. Stocks haven't been that low since May, 1952. Over the last 12 months, they have fallen 152,512 tons. The firm position would have been impossible without the aid of the government account, which has taken 167,786 tons over the same period, but the strong consumers' demand is the element which is holding the market up today.

Demand for special high grade has continued heavy throughout 1955. The American Zinc Institute lists stocks on June 30 as 3687 tons, which is no stock at all. Almost as impressive is the continued reduction of prime western on hand, which is now at 39,645 tons, less than a month's production at current rates. High grade and intermediate stocks also dropped. The only cautious note sounded by the institute's report was the decrease in unfilled orders from 70,084 tons on June 1 to 57,231 tons on July 1.

Aluminum—The Aluminum Association's report is just as good, showing May shipments for six of the nine major product classifications ahead of April. Sheet and plate led the way with 118,369,243 lb, a new record. New shipment records also were set by foil (16,819,106 lb) and extruded products (35,054,901 lb). Other classifications showing increases over April were wire other than conductor, ACSR and bare cable, and forgings. All product categories for the first five months of 1955 are ahead of the 1954 period.

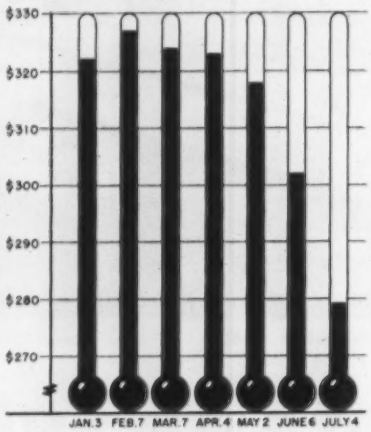
Lead—Mine production of recoverable lead in May was 28,612 tons, up slightly from April and a little over the monthly average so far in 1955. May's production was slightly higher than the 28,553-ton monthly average for 1953 and well above the average of 26,582 tons last year.

Consumption of lead so far in 1955 has been averaging about 90,800 tons a month. That average probably will not hold for July because of the reduction in supply caused by the strike against American Smelting & Refining Co., but the outlook for the last half of the year otherwise is good. Battery shipments are rising, and it has been pointed out that replacement sales of 12-volt units, which consume more lead, are becoming significant.

Magnesium—After dipping in April because of a strike at the Dow plant in Texas, production of magnesium bounced back to 4277 tons in May. This is above the monthly average for the year so far, but it is well below the 6460 tons in May, 1954.

The bright note in magnesium is sounded by wrought products. Shipments in May continued to show gains over 1954 figures, standing at 971 tons compared with only 564 tons last year. For the first five months of this year, shipments amounted to 4534 tons compared with just 2670 tons for the same year-ago period.

Mercury Takes a Nose Dive
(Dollars per 76 lb flask*)



*Lowest price quoted in STEEL, the first issue of each month.

Trouble Ahead?—Good as the figures may appear today, they are headed for a period of uncertainty, mainly because of labor contract negotiations. Aluminum Co. of America opened negotiations last week, and the outcome undoubtedly will set the pattern for the industry. If there is no agreement by July 30, the CIO United Steelworkers of America can call a strike. Such an action would produce much the same effect on the aluminum industry as the copper strike has had on that industry. Neither can afford the loss of production. The other basic mining industries also face contract negotiations throughout the summer.

Yates Scored on Aluminum Stand

Reverberations from the recent investigation of the aluminum industry by the subcommittee of the House Select Committee on Small Business have not died yet. Indeed, they are becoming louder as two members of the three-man committee accuse the chairman of twisting the facts. Timothy P. Sheehan (Rep., Ill.) and Tom Steed (Dem., Okla.) claim that the closing session on June 21 "demonstrated conclusively that every possible step to alleviate the shortage had been taken by both the government and the primary (aluminum) producers." They said that Chairman Sidney R. Yates (Dem., Ill.) was wrong in implying that the three primary producers were "taking business away from certain segments of the industry."

Mercury Price Cools Off

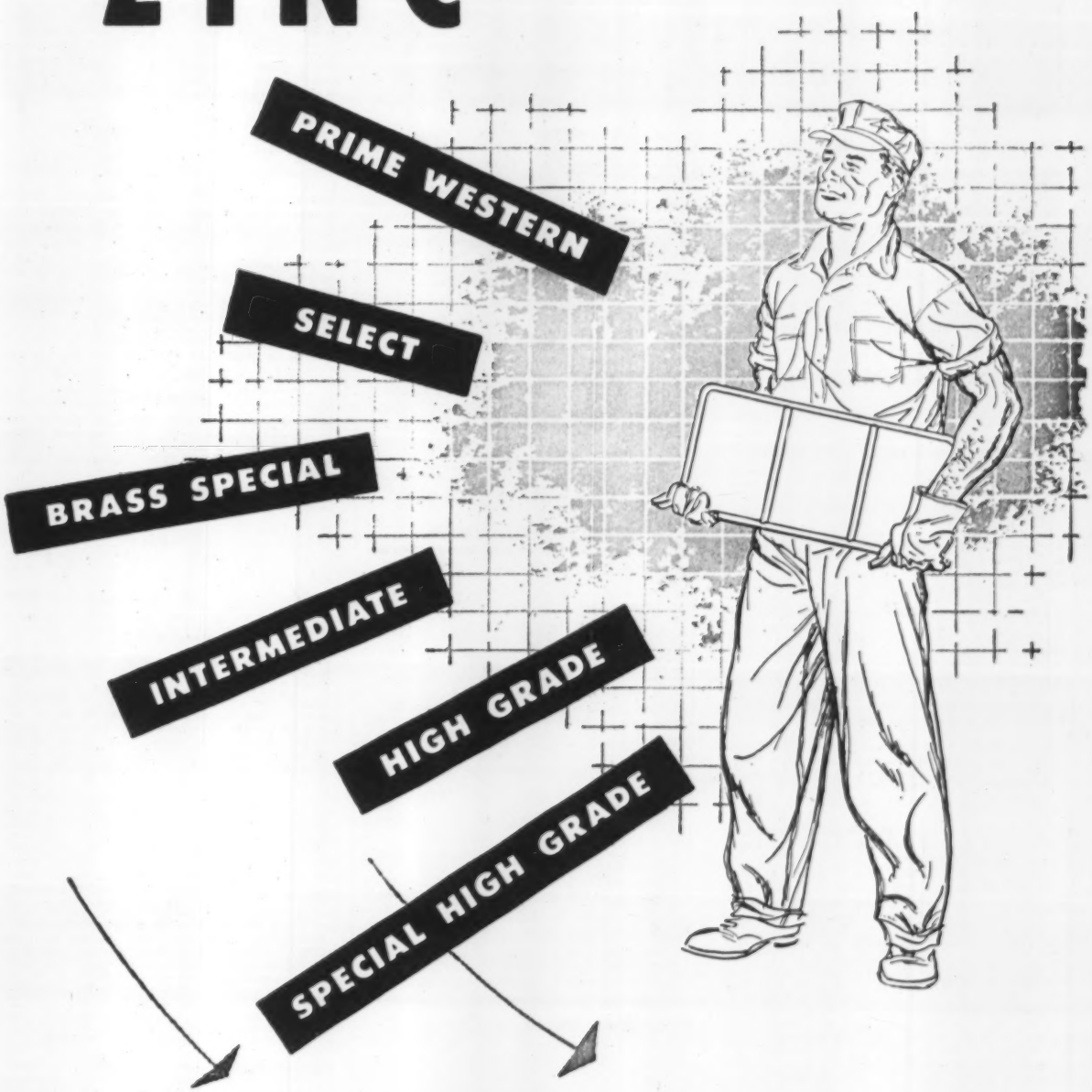
The price of mercury continues the downfall from its lofty perch of a year or more. The graph at left shows how rapidly it has cooled since the first of the year. At press-time, the quotation in New York had declined again to $269.50. Since the government withdrew as a heavy buyer, the market has been oversupplied.

Aluminum Export Quota Set

Bureau of Foreign Commerce has set a quota of 5000 tons on aluminum scrap for export in the third quarter. This is down from 9000 tons in second quarter but a far cry from the 1000 tons recommended by several segments of the industry.

SLAB ZINC

every grade of ZINC
for urgent military and
civilian requirements



AMERICAN ZINC SALES COMPANY

Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 23.20, pigs 21.50. 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 25.00; No. 43, 5% Si, 24.50; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 26.50; No. 195, 4.5% Cu, 0.8% Si, 25.90; No. 214, 3.8% Mg, 26.40; No. 356, 7% Si, 0.3% Mg, 24.90.

Antimony: R.M.M. brand, 99.5%, 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic 36.00 deld. Conn. Valley; 36.00 deld. Midwest; Lake 36.00 deld; Fire refined 35.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$300 nom, per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 99% +, cups or ingot, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: 99.8%, self-palletizing pig 28.50; notched ingot 29.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingots; for Los Angeles, add 2.50 for both pig and ingot. Sticks 1.3 in. diameter, 49.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 34.00; alloy M 36.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50.

Mercury: Open market, spot, New York, $269.50 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3-$3.25 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $80-$100, nom., per troy oz.

Palladium: $22-$24 per troy oz.

Platinum: $79-$82 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $6-$7.25 per lb.

Silver: Open market, 90.125 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod $68.70 per lb; powder $56.63 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 96.50.

Titanium: Sponge, 99.3 + %, grade A-1 ductile (0.3% Fe max) $3.95, grade A-2 (0.5% Fe max) $3.50 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots $4.35-$4.40 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99 + % hydrogen reduced, $4.65. Treated ingots, $6.70.

Zinc: Prime Western, 12.50; brass special, 12.75; intermediate, 13.00, E. St. Louis, freight allowed over 0.50 per pound. High grade, 13.65; special high grade, 14.00 deld. Diecasting alloy ingot No. 3, 16.50; Nos. 2 and 5, 17.00, deld.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, $7.50 per lb. Powder, electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 27.25-29.00; No. 12 foundry alloy (No. 2 grade), 26.50; 5% silicon alloy, 0.60 Cu max, 28.50-28.75; 13 alloy, 0.60 Cu max, 28.50-28.75; 195 alloy, 28.50-28.75; 108 alloy, 27.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 27.50; grade 2, 26.50; grade 3, 25.50; grade 4, 25.00.

Brass Ingot: Red brass, No. 115, 36.50; tin bronze No. 225, 48.50; No. 245, 41.75; high-leaded tin bronze No. 305, 39.75; No. 1 yellow No. 405, 30.75; manganese bronze No. 421, 33.75.

Magnesium Alloy Ingot: AZ63A, 32.00; AZ91B, 32.00; AZ91C, 32.00; AZ92A, 32.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.74; rod, bar, wire, $1.71.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 41.35; 30,000-lb lots, 41.48; l.c.l., 41.98. Weatherproof, 100,000-lb, 40.78; 30,000 lb, 41.03; l.c.l., 41.53. Magnet wire deld., 15,000 lb or more, 48.15; l.c.l., 48.90.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more $20 per cwt; pipe, full coils $20 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $14.00-$14.50; sheared mill plate, $11.00; strip, $14.00-$14.50; wire, $10.00-$10.50; forging billets, $8.75; hot-rolled and forged bars, $8.75.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00; ribbon zinc in coils, 20.00-20.50; plates, 19.00-22.25.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	76	115
Seamless Tubes	122	108	153
Shot, Blocks		65	

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	63.5	62.0	...	...
0.156-0.172	53.9	52.3	...	...
0.188	53.9	52.3	...	66.8
0.219-0.234	51.1	49.5	...	...
0.250-0.281	51.1	49.5	...	63.7
0.313	51.1	49.5	...	60.8
Cold-finished				
0.375-0.547	49.9	47.5	59.8	57.2
0.563-0.688	49.9	47.5	56.9	53.7
0.750-1.000	48.7	46.3	52.1	50.6
1.063	48.7	46.3	...	48.9
1.125-1.500	46.9	44.6	50.4	48.9
Rolled				
1.563	45.7	43.4	...	...
1.625-2.000	45.1	42.8	...	47.2
2.125-2.500	44.0	41.7	...	...
2.563-3.375	42.7	40.5	...	...

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	35.9	40.4	...	...
0.135-0.096	36.4	41.3	...	...
0.095-0.077	37.1	42.3	34.6	39.6
0.076-0.061	37.7	43.2	34.8	39.8
0.060-0.048	38.2	43.6	35.1	40.2
0.047-0.037	38.7	44.5	35.6	40.6
0.037-0.030	39.1	45.0	36.0	41.3
0.029-0.024	39.7	45.5	36.3	41.6
0.023-0.019	40.4	46.9	37.1	42.6
0.018-0.017	41.2	...	37.7	43.5
0.016-0.015	42.1	...	38.5	44.7
0.014	43.1	...	39.5	46.0
0.013-0.012	44.3	...	40.2	47.0
0.011	45.3	...	41.4	48.6
0.010-0.0095	46.5	...	42.5	50.2
0.009-0.0085	47.8	...	44.0	52.3
0.008-0.0075	49.4	...	45.2	54.1
0.007	50.9	...	46.7	56.4
0.006	52.5	...	48.1	61.4

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72.240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.6	38.8
5050-F	35.7	39.9
3004-F	36.7	41.6
5052-F	38.4	43.4
6061-T6	39.6	44.0
2024-T4*	41.8	47.9
7075-T6*	49.6	56.2

*24-48 in. widths or diam, 72-180 in. lengths.

ALUMINUM

Forging Stock: Round, Class 1, 47.80-37.30, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 53.60-41.00 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
⅜	$16.10	2	$ 49.55
1	25.35	4	136.65
1¼	34.30	6	244.90
1½	41.00	8	368.50

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 97.00, 0.064-in. 76.00, 0.125-in. 61.50, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 50.00, 30,000 lb or more, 0.250 in. and over, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 62.00, 30,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in., 72.20; 1 x 4 in., 67.00. Rod, 1 in., 69.00; 2 in., 66.50. Tubing, 1 in. OD x 0.065 in., 90.00. Angles, 1 x 1 x ⅛-in., 75.90; 2 x 2 x ¼-in., 70.00. Channels, 5 in., 70.90. I-beams, 5 in., 70.20.

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 16.50-17.00; old sheets, 14.50-15.00; borings and turnings, 9.00-10.00; crankcases, 14.50-15.00; industrial castings, 14.50-15.00.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	54.76b	52.36c	....	54.82	32.000	32.000	31.250
Yellow Brass	46.27	37.22d	46.81	49.18	23.875	23.625	22.000
Red Brass, 85%	50.99	50.93	51.53	53.80	28.125	27.875	27.375
Low Brass, 80%	49.75	49.69	50.29	52.56	27.000	26.750	26.750
Naval Brass	49.99	44.30	57.05	53.15	23.125	21.875	21.875
Com. Bronze, 90%	52.78	52.72	53.32	55.34	29.250	29.000	28.500
Nickel Silver, 10%	60.20	62.58g	62.63	....	27.625	27.375	13.515
Phos. Bronze, A, 5%	73.03	73.63	73.53	74.71	32.250	32.000	31.000
Silicon Bronze	58.82	58.01	58.86	60.80e	31.125	30.875	30.125
Manganese Bronze	53.73	47.83	56.34	....	23.125	21.875	21.875
Munts Metal	48.14	43.96	....	....	22.375	22.125	21.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: No. 1 heavy copper and wire, 33.50-34.00; No. 2 heavy copper and wire, 32.50-33.00; light copper, 30.50-31.00; No. 1 composition red brass, 26.50-27.00; No. 1 composition turnings, 26.00-26.50; yellow brass turnings, 15.50-16.00; new brass clippings, 21.50-23.00; light brass, 16.50-17.00; heavy yellow brass, 18.50-19.00; new brass rod ends, 20.50-22.00; auto radiators, unsweated, 20.50-21.00; cocks and faucets, 21.00-21.50; brass pipe, 21.00-21.50.

Lead: Heavy, 11.50-12.00; battery plates, 6.50-6.75; linotype and stereotype, 14.00-14.25; electrotype, 12.00-12.50; mixed babbitt, 14.50.

Magnesium: Clippings 18.50-19.50; clean castings 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.

Monel: Clippings, 38.00-39.00; old sheets, 33.00-34.50; turnings, 29.50; rods, 38.00-39.00.

Nickel: Sheets and clips, 80.00-90.00; rolled anodes, 80.00-90.00; turnings, 65.00-75.00; rod ends, 80.00-90.00.

Zinc: Old zinc, 5.00-5.50; new die-cast scrap, 5.00-5.50; old die-cast scrap, 3.50-3.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 20.00-20.25; 3003 clippings, 20.00; 6151 clippings, 19.50-19.75; 5052 clippings, 19.50-19.75; 2014 clippings, 19.00-19.25; 2017 clippings, 19.00-19.25; 2024 clippings, 19.00-19.25; mixed clippings, 18.75-19.75; old sheet, 16.00-17.00; old cast, 16.00-17.00; clean old cable (free of steel), 19.75-20.00; borings and turnings, 16.75-18.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 48.00; light scrap 43.00.

Copper and Brass: No. 1 copper, 36.50-37.00; No. 2 copper, 35.00-35.50; light copper, 33.00-33.75; refinery brass (60% copper) per dry copper content, 30.00-31.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 copper, 36.00-36.50; No. 2 copper, 34.50-35.00; light copper, 32.25-32.75; No. 1 composition borings, 28.50-29.50; No. 1 composition solids, 29.00-30.00; heavy yellow brass solids, 22.00-22.50; yellow brass turnings, 20.50-21.00; radiators, 22.50-23.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.

Copper: Flat-rolled 51.42, oval 50.92, 5000-10,000 lb; electrodeposited 45.78, 2000-5000 lb lots; cast 52.54, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb $1.015; 100-499 lb 99.50; 500-4999 lb 95.50; 5000-29,999 lb 93.50; 30,000 lb 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.

Tin: Bar or slab, less than 200 lb, $1.145; 200-499 lb, $1.13; 500-999 lb, $1.125; 1000 lb or more, $1.12.

Zinc: Bar, 21.00; bar or flat top, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: 100 lb 76.80; 200 lb 76.05; 300 lb 75.80; 400-900 lb 75.05; 1000 lb and over 73.05; effective Mar. 24, 1955.

Copper Sulphate: Crystal, 100 lb 21.50; 200 lb 18.50; 300 lb 17.50; 400 lb 17.00; 500-1900 lb 15.50; 2000-10,000 lb 15.25; 10,000 lb and up 1515. Powder, add 0.5 to above prices. Effective Mar. 29, 1955.

Nickel Chloride: 100 lb 46.50; 200 lb 44.50; 300 lb 43.50; 400-4900 lb 41.50; 5000-9900 lb 39.50; 10,000 lb and over 38.50. All prices eastern delivery, effective Jan. 1, 1955.

Nickel Sulphate: 100 lb 38.25; 200 lb 36.25; 300 lb 35.25; 400-4900 lb 33.25; 5000-35,900 lb 31.25; 36,000 lb 30.25. All prices eastern delivery, effective Jan. 1, 1955.

Silver Cyanide: (Cents per ounce) 4-oz bottle, 83.125; 16-oz bottle, 81.875; 80-oz bottle, 79.375; 100-oz bottle, 79.375; f.o.b. St. Louis, New York and Los Angeles. Effective Apr. 6, 1955.

Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb, 72.50; 100-600 lb, 58.10; 700-1900 lb, 55.70; 2000-9900 lb, 53.90; 10,000 lb or more, 52.80.

Stannous Chloride (Anhydrous): Less than 50 lb, $1.588; 50 lb, $1.248; 100-300 lb, $1.098; 400-900 lb, $1.074; 1000-1900 lb, $1.049; 2000-4900 lb, $1.013; 5000-19,000 lb, 95.20; 20,000 lb or more, 89.10.

Stannous Sulfate: Less than 50 lb, $1.287; 50 lb, 98.70; 100-1900 lb, 96.70; 2000 lb or more, 94.70.

Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.

There's *this* about "Fischer Turned" BRASS AND ALUMINUM NUTS

CLASS 2 PRECISION THREADS

COUNTERSUNK BOTH SIDES

TAPPED THROUGH & SQUARE WITH FACE

BURRLESS

CLEANED AND DEGREASED

PROMPT DELIVERY

All nuts are not the same. Fischer brass and aluminum nuts, for example, are *precision turned* ... making possible new economies in assembly operations.

You pay no premium for this extra quality ... Fischer *turned* nuts cost no more than those produced by other, less accurate methods.

A complete range of standard types and sizes is stocked at the factory ... "specials" are produced quickly and inexpensively.

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1905 1955 50th ANNIVERSARY FISCHER SPECIAL MFG. CO. CINCINNATI, OHIO

Fischer SPECIAL MFG. CO.

476 Morgan St.
Cincinnati 6, Ohio

Write today for complete catalog

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company. Key on page 151. Key to footnotes, page 153.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5	$61.50

INGOTS, Alloy (NT)

Detroit R7	$65.00
Houston S5	*74.00*
Midland,Pa. C18	65.00
Munhall,Pa. U5	69.00

BILLETS, BLOOMS & SLABS Carbon, rerolling (NT)

Aliquippa,Pa. J5	$64.00
Bessemer,Pa. U5	68.50
Bridgeprot,Conn. N19	69.00
Buffalo R2	*68.50*
Clairton,Pa. U5	68.50
Ensley,Ala. T2	68.50
Fairfield,Ala. T2	68.50
Fontana,Calif. K1	*76.00*
Gary,Ind. U5	68.50
Johnstown,Pa. B2	*68.50*
Lackawanna,N.Y. B2	*68.50*
LoneStar,Tex. L6	70.00
Munhall,Pa. U5	68.50
Pittsburgh J5	64.00
So.Chicago,Ill. R2, U5	*68.50*
So.Duquesne,Pa. U5	68.50
Youngstown R2	*68.50*

Carbon, Forging (NT)

Aliquippa,Pa. J5	$78.00
Bessemer,Pa. U5	84.50
Bridgeport,Conn. N19	83.00
Buffalo R2	*84.50*
Canton,O. R2	*86.50*
Clairton,Pa. U5	84.50
Conshohocken,Pa. A3	*89.50*
Ensley,Ala. T2	84.50
Fairfield,Ala. T2	84.50
Fontana,Calif. K1	*92.00*
Gary,Ind. U5	84.50
Geneva,Utah C11	78.00
Houston S5	*89.50*
Johnstown,Pa. B2	*84.50*
Lackawanna,N.Y. B2	*84.50*
LosAngeles B3	*94.00*
Midland,Pa. C18	78.00
Munhall,Pa. U5	84.50
Pittsburgh J5	78.00
Seattle B3	*98.00*
So.Chicago R2,U5,W14	84.50
So.Duquesne,Pa. U5	84.50
So.SanFrancisco B3	*94.00*

Alloy, Forging (NT)

Bethlehem,Pa. B2	$86.00
Buffalo R2	*96.00*
Canton,O. T7	86.00
Canton,O. R2	*96.00*
Conshohocken,Pa. A3	*103.00*
Detroit R7	86.00
Fontana,Calif. K1	*115.00*
Gary,Ind. U5	96.00
Houston S5	*101.00*
Ind.Harbor,Ind. Y1	*96.00*
Johnstown,Pa. B2	*96.00*
Lackawanna,N.Y. B2	*96.00*
LosAngeles B3	*116.00*
Massillon,O. R2	*96.00*
Midland,Pa. C18	86.00
Munhall,Pa. U5	96.00
So.Chicago R2,U5,W14	96.00
So.Duquesne,Pa. U5	96.00
Struthers,O. Y1	*96.00*
Warren,O. C17	*96.00*

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2	*$103.50*
Canton,O. R2	*103.50*
Cleveland R2	*103.50*
Gary,Ind. U5	103.50
So.Chicago R2, W14	*103.50*
So.Duquesne,Pa. U5	103.50

SKELP

Aliquippa,Pa. J5	4.00
LoneStar,Tex. L6	4.30
Munhall,Pa. U5	4.225
SparrowsPoint,Md. B2	*4.225*
Warren,O. R2	*4.225*
Youngstown R2	*4.225*
Youngstown U5	4.225

WIRE RODS

AlabamaCity,Ala. R2	*5.025*
Aliquippa,Pa. J5	4.675
Alton,Ill. L1	4.85
Buffalo B11, W12	*5.025*
Cleveland A7	5.025
Donora,Pa. A7	5.025
Fairfield,Ala. T2	5.025
Houston S5	*5.275*
IndianaHarbor,Ind. Y1	*5.025*
Johnstown,Pa. B2	*5.025*
Joliet,Ill. A7	5.025
KansasCity,Mo. S5	*5.275*
Kokomo,Ind. C16	4.775
Los Angeles B3	*5.825*
Minnequa,Colo. C10	4.925
Monessen,Pa. P7	4.675
No.Tonawanda,N.Y.B11	4.675
Pittsburg,Calif. C11	*5.675*
Portsmouth P12	4.675
Roebling,N.J. R5	4.775
So.Chicago,Ill. R2	*5.025*
SparrowsPoint,Md. B2	*5.125*
Sterling,Ill.(1) N15	*5.025*
Sterling,Ill. N15	*5.125*
Struthers,O. Y1	*5.025*
Torrance,Calif. C11	5.475
Worcester,Mass. A7	5.325

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2	*4.60*
Aliquippa,Pa. J5	4.25
Bessemer,Ala. T2	4.60
Bethlehem,Pa. B2	*4.65*
Birmingham C15	*4.60*
Clairton,Pa. U5	4.60
Fairfield,Ala. T2	4.60
Fontana,Calif. K1	*5.25*
Gary,Ind. U5	4.60
Geneva,Utah C11	*4.60*
Houston S5	*4.70*
Ind.Harbor,Ind. 1-2	*4.60*
Johnstown,Pa. B2	*4.65*
KansasCity,Mo. S5	*4.70*
Lackawanna,N.Y. B2	*4.65*
LosAngeles B3	*5.30*
Minnequa,Colo. C10	4.70
Munhall,Pa. U5	4.60
Niles,Calif. P1	4.90
Portland,Oreg. O4	*5.35*
Phoenixville,Pa. P4	*4.65*
Seattle B3	*5.15*
So.Chicago U5, W14	4.60
So.SanFrancisco B3	*5.25*
Torrance,Calif. C11	*5.30*
Weirton,W.Va. W6	*4.60*

Wide Flange

Bethlehem,Pa. B2	*4.65*
Clairton,Pa. U5	4.60
Fontana,Calif. K1	*5.40*
Lackawanna,N.Y. B2	*4.65*
Munhall,Pa. U5	4.60
Phoenixville,Pa. P4	*4.65*
So.Chicago,Ill. U5	4.60

Alloy Std. Shapes

Clairton,Pa. U5	5.65
Fontana,Calif. K1	*7.30*
Gary,Ind. U5	5.65
Houston S5	*5.75*
Munhall,Pa. U5	5.65
So.Chicago,Ill. U5	5.65

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5	6.40
Bessemer,Ala. T2	6.75
Bethlehem,Pa. B2	*6.80*
Clairton,Pa. U5	6.75
Fairfield,Ala. T2	6.75
Fontana,Calif. K1	*7.40*
Gary,Ind. U5	6.75
Geneva,Utah C11	6.40
Houston S5	*6.85*
Ind.Harbor,Ind. 1-2, Y1	*6.75*
Johnstown,Pa. B2	*6.80*
KansasCity,Mo. S5	*6.85*
Lackawanna,N.Y. B2	*6.80*
LosAngeles B3	*7.45*
Munhall,Pa. U5	6.75
Seattle B3	*7.50*
So.Chicago,Ill. U5, W14	*6.75*
So.SanFrancisco B3	*7.40*
Struthers,O. Y1	*6.75*

H.S., L.A. Wide Flange

Bethlehem,Pa. B2	*6.80*
Lackawanna,N.Y. B2	*6.80*
Munhall,Pa. U5	6.75
So.Chicago,Ill. U5	6.75

PILING

BEARING PILES

Bethlehem,Pa. B2	*4.65*
Lackawanna,N.Y. B2	*4.65*
Munhall,Pa. U5	4.60
So.Chicago,Ill. U5	4.60

STEEL SHEET PILING

Ind.Harbor,Ind. 1-2	*5.45*
Lackawanna,N.Y. B2	*5.45*
Munhall,Pa. U5	5.45
So.Chicago,Ill. U5	5.45

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2	*4.50*
Aliquippa,Pa. J5	*4.50*
Ashland,Ky.(15) A10	4.225
Bessemer,Ala. T2	4.50
BridgeportConn. N19	*4.75*
Buffalo R2	*4.50*
Clairton,Pa. U5	4.50
Claymont,Del. C22	*4.50*
Cleveland R2	*4.60*
Cleveland J5	*4.60*
Coatesville,Pa. L7	*4.50*
Conshohocken,Pa. A3	*4.50*
Ecorse,Mich. G5	*4.60*
Fairfield,Ala. T2	4.50
Fontana,Calif.(30) K1	*5.15*
Gary,Ind. U5	4.50
Geneva,Utah C11	*4.50*
GraniteCity,Ill. G4	4.425
Harrisburg,Pa. C5	*4.50*
Houston S5	*4.60*
Ind.Harbor,Ind. 1-2, Y1	*4.50*
Johnstown,Pa. B2	*4.50*
Lackawanna,N.Y. B2	*4.50*
LoneStar,Tex. L6	4.55
Mansfield,O. E6	*4.50*
Minnequa,Colo. C10	5.075
Munhall,Pa. U5	4.50
Newport,Ky. N9	*4.50*
Pittsburgh J5	*4.50*
Riverdale,Ill. A1	*4.50*
Seattle B3	*5.40*
Sharon,Pa. S3	4.225
So.Chicago R2, U5, W14	4.50
SparrowsPoint,Md. B2	*4.50*
Steubenville,O. W10	*4.50*
Warren,O. R2	*4.50*
Weirton,W.Va. W6	*4.50*
Youngstown R2, U5, Y1	4.50

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1	*6.30*
Geneva,Utah C11	*5.65*
Johnstown,Pa. B2	*5.65*
SparrowsPoint,Md. B2	*5.65*

PLATES, Wrought Iron

Economy,Pa. B14	9.80

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5	6.45
Bessemer,Ala. T2	6.725
Clairton,Pa. U5	6.725
Cleveland J5	6.45
Cleveland R2	*6.725*
Coatesville,Pa. L7	*6.725*
Conshohocken,Pa. A3	*6.725*
Ecorse,Mich. G5	*6.825*
Fairfield,Ala. T2	6.725
Fontana,Calif.(30) K1	*7.375*
Gary,Ind. U5	6.725
Geneva,Utah C11	*6.725*
Houston S5	*6.825*
Ind.Harbor,Ind. 1-2, Y1	*6.725*
Johnstown,Pa. B2	*6.725*
LosAngeles B3	*7.625*
Munhall,Pa. U5	6.725
Pittsburgh J5	6.45
Seattle B3	*7.625*
Sharon,Pa. S3	6.45
So.Chicago,Ill. U5, W14	6.725
SparrowsPoint,Md. B2	*6.725*
Youngstown U5, Y1	*6.725*

PLATES, Alloy

Bridgeport,Conn. N19	*6.55*
Claymont,Del. C22	*6.30*
Coatesville,Pa. L7	*6.30*
Fontana,Calif. K1	*6.95*
Gary,Ind. U5	6.30
Houston S5	*6.40*
Ind.Harbor,Ind. Y1	*6.30*
Johnstown,Pa. B2	*6.30*
Munhall,Pa. U5	6.30
Newport,Ky. N9	*6.30*
Seattle B3	*7.20*
Sharon,Pa. S3	5.80
So.Chicago,Ill. U5, W14	*6.30*
SparrowsPoint,Md. B2	*6.30*
Youngstown Y1	*6.30*

FLOOR PLATES

Cleveland J5	*5.575*
Conshohocken,Pa. A3	*5.575*
Harrisburg,Pa. C5	*5.575*
Ind.Harbor,Ind. 1-2	*5.575*
Munhall,Pa. U5	5.575
So.Chicago,Ill. U5	5.575

PLATES, Ingot Iron

Ashland c.l. (15) A10	4.475
Ashland l.c.l. (15) A10	4.975
Cleveland c.l. R2	*5.10*
Warren,O. c.l. R2	*5.10*

BARS

BAR, Hot-Rolled Carbon

Ala.City,Ala. R2	*4.65*
Aliquippa,Pa. J5	4.30
Alton,Ill. L1	4.50
Atlanta A11	*4.85*
Bessemer,Ala. T2	4.65
Birmingham C15	*4.65*
Bridgeport,Conn. N19	*4.80*
Buffalo R2	*4.65*
Canton,O. R2	*4.75*
Clairton,Pa. U5	4.65
Cleveland R2	*4.65*
Ecorse,Mich. G5	*4.75*
Emeryville,Calif. J7	*5.40*
Fairfield,Ala. T2	4.65
FairlessHills,Pa. U5	4.80
Fontana,Calif. K1	*5.35*
Gary,Ind. U5	4.65
Houston S5	*4.90*
Ind.Harbor,Ind. 1-2, Y1	*4.65*
Johnstown,Pa. B2	*4.65*
Midland,Pa. C18	4.30
Milton,Pa. M18	*4.65*
Minnequa,Colo. C10	4.75
Niles,Calif. P1	5.00
N.Tonawanda,N.Y. B11	4.30
Pittsburg,Calif. C11	*5.35*
Pittsburgh J5	4.30
Portland,Oreg. O4	*5.40*
Seattle B3, N14	5.40
So.Chicago R2, U5, W14	4.65
So.Duquesne,Pa. U5	4.65
So.SanFran.,Calif. B3	*5.40*
Sterling,Ill.(1) N15	*4.65*
Struthers,O. Y1	*4.65*
Torrance,Calif. C11	*5.35*
Warren,O. R2	*4.65*
Weirton,W.Va. W6	*4.65*
Youngstown R2, U5	*4.65*

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2	*5.575*
Bridgeport,Conn. N19	*5.725*
Buffalo R2	*5.575*
Canton,O. T7	5.075
Canton,O. R2	*5.575*
Clairton,Pa. U5	5.575
Detroit R7	5.075
Ecorse,Mich. G5	*5.675*
Fontana,Calif. K1	*6.625*
FairlessHills,Pa. U5	5.725
Gary,Ind. U5	5.575
Houston S5	*5.825*
Ind.Harbor,Ind. 1-2, Y1	*5.575*
Johnstown,Pa. B2	*5.575*
KansasCity,Mo. S5	*5.825*
Lackawanna,N.Y. B2	*5.575*
LosAngeles B3	6.125
Massillon,O. R2	*5.575*
Midland,Pa. C18	5.075
So.Chicago R2,U5,W14	5.575
So.Duquesne,Pa. U5	5.075
Struthers,O. Y1	*5.575*
Warren,O. C17	*5.575*
Youngstown U5	5.575

BARS, H.R. Leaded Alloy

Warren,O. C17	*6.325*

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5	6.45
Bessemer,Ala. T2	6.80
Bethlehem,Pa. B2	*6.80*
Clairton,Pa. U5	6.80
Cleveland R2	*6.80*
Ecorse,Mich. G5	*6.90*
Fairfield,Ala. T2	6.80
Fontana,Calif. K1	*7.50*
Gary,Ind. U5	6.80
Houston S5	*7.05*
Ind.Harb.,Ind. 1-2, Y1	*6.80*
Johnstown,Pa. B2	*6.80*
KansasCity,Mo. S5	*7.05*
Lackawanna,N.Y. B2	*6.80*
LosAngeles B3	*7.50*
Pittsburgh J5	6.45
Seattle B3	*7.55*
So.Chicago W14	*6.80*
So.Duquesne,Pa. U5	6.80
So.SanFrancisco B3	*7.55*
Struthers,O. Y1	*6.80*
Warren,O. R2	*6.80*
Youngstown U5	6.80

BAR SIZE ANGLES; H.R. Carbon

Atlanta A11	*4.85*
Bethlehem,Pa. B2	*4.80*

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5	4.30
Atlanta A11	*4.85*
Fontana,Calif. K1	*5.35*
Niles,Calif. P1	5.00
Pittsburgh J5	4.30
Portland,Oreg. O4	5.05
SanFrancisco S7	4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5	5.65
Gary,Ind. U5	5.65
Houston S5	*5.90*
KansasCity,Mo. S5	*5.90*
Youngstown U5	5.65

BARS, Cold-Finished Carbon

Ambridge,Pa. W18	*5.90*
BeaverFalls,Pa. M12	5.40
BeaverFalls,Pa. R2	*5.90*
Buffalo B5	*5.95*
Camden,N.J. P13	*6.35*
Carnegie,Pa. C12	5.40
Chicago W18	*5.90*
Cleveland A7	*5.90*
Detroit R7	5.40
Detroit P17	5.60
Detroit B5	*6.10*
Donora,Pa. A7	5.90
Elyria,O. W8	5.40
FranklinPark,Ill. N5	*5.90*
Gary,Ind. R2	*5.90*
GreenBay,Wis. F7	*5.90*
Hammond,Ind. M13	*5.90*
Hartford,Conn. R2	*6.40*
Harvey,Ill. B5	*5.90*
LosAngeles S30	6.85
LosAngeles R2	*7.35*
Mansfield,Mass. B5	*6.45*
Massillon,O. R2, R8	*5.90*
Midland,Pa. C18	5.40
Monaca,Pa. S17	5.40
Newark,N.J. W18	*6.35*
NewCastle,Pa. (17) B4	5.40
Pittsburgh J5	5.40
Plymouth,Mich. P5	5.65
Putnam,Conn. W18	*6.45*
Readville,Mass. C14	*6.45*
So.Chicago,Ill. W14	*5.90*
SpringCity,Pa. K3	*6.35*
Struthers,O. Y1	*5.90*
Waukegan,Ill. A7	5.90
Worcester,Mass. W19	5.85
Youngstown F3, Y1	*5.90*

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md. C19	*5.15*

BARS, Cold-Finished Alloy

Ambridge,Pa. W18	*7.425*
BeaverFalls,Pa. R2	*7.425*
Bethlehem,Pa. B2	*7.425*
Buffalo B5	*7.425*
Camden,N.J. P13	*7.60*
Canton,O. T7	6.625
Carnegie,Pa. C12	6.625
Chicago W18	*7.425*
Cleveland A7, C20	6.625
Detroit R7	6.625
Detroit P17	6.825
Detroit B5	*7.625*
Donora,Pa. A7	6.625
Elyria,O. W8	6.625
Gary,Ind. R2	*7.425*
GreenBay,Wis. F7	*7.425*
Hammond,Ind. M13	*7.425*
Hartford,Conn. R2	*7.725*
Harvey,Ill. B5	*7.425*
Lackawanna,N.Y. B2	*7.425*
LosAngeles S30	8.30
Mansfield,Mass. B5	*7.725*
Massillon,O. R2, R8	*7.425*
Midland,Pa. C18	6.625
Monaca,Pa. S17	6.625
Newark,N.J. W18	*7.60*
Plymouth,Mich. P5	6.825
So.Chicago W14	*7.425*
SpringCity,Pa. K3	*7.60*
Struthers,O. Y1	*7.425*
Warren,O. C17	*7.425*
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925
Youngstown F3, Y1	*7.425*

BARS, C.F. Leaded Alloy

Ambridge,Pa. W18	7.525
Camden,N.J. P13	*8.50*
Carnegie,Pa. C12	7.525
Chicago W18	7.525
Cleveland C20	7.525
Monaca,Pa. S17	7.525
Newark,N.J. W18	7.70
SpringCity,Pa. K3	*8.50*
Warren,O. C17	*8.325*

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2	*4.65*
Atlanta A11	*4.85*
Birmingham C15	*4.65*
Buffalo R2	*4.65*
Cleveland R2	*4.65*
Ecorse,Mich. G5	*4.75*
Emeryville,Calif. J7	*5.40*
Fairfield,Ala. T2	4.65
FairlessHills,Pa. U5	4.80
Fontana,Calif. K1	*5.35*
Ft.Worth,Tex.(42) T4	*5.10*
Gary,Ind. U5	4.65
Houston S5	*4.90*

Ind.Harbor,Ind. 1-2, Y1 4.65
Johnstown,Pa. B2 4.65
Joliet,Ill. P22 4.65
KansasCity,Mo. S5 4.90
Lackawanna,N.Y. B2 4.65
LosAngeles B3 5.35
Milton,Pa. M18 4.65
Minnequa,Colo. C10 4.75
Niles,Calif. P1 5.00
Pittsburg,Calif. C11 5.35
Pittsburgh J5 4.30
Portland,Oreg. O4 5.40
SandSprings,Okla. S5 5.15
Seattle B3, N14 5.40
So.Chicago R2 4.65
So.Duquesne,Pa. U5 4.65
So.SanFrancisco B3 5.40
SparrowsPoint,Md. B2 4.65
Sterling,Ill.(1) N15 4.65
Sterling,Ill. N15 4.75
Struthers,O. Y1 4.65
Torrance,Calif. C11 5.35
Youngstown R2, U5, Y1 4.65

BARS, Reinforcing (Fabricated; to Consumers)

Johnstown,Pa. ½-1" B2 6.15
KansasCity,Kans. S5 6.45
Lackawanna,N.Y. B2 6.17
LosAngeles B3 5.95
Marion,O. P11 5.55
Pittsburgh J5, U5 5.72
Seattle B3, N14 6.15
So.SanFrancisco B3 6.00
SparrowsPt. ½-1" B2 6.15
Williamsport,Pa. S19 5.60

RAIL STEEL BARS

Avis,Pa. (3) J8 4.25
ChicagoHts.(3) 1-2 4.55
ChicagoHts.(4) 1-2 4.65
Ft.Worth,Tex.(26) T4 4.95
Franklin,Pa.(3) F5 4.20
Franklin,Pa.(4) F5 4.30
Marion,O.(3) P11 4.20
Moline,Ill.(3) R2 4.65
Tonawanda(3) B12 4.15
Tonawanda(4) B12 4.30
Williamsport,Pa.(3) S19 4.65

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.)B14 13.50
Economy(Staybolt) B14 13.80
McK.Rks.(S.R.) L5 10.85
McK.Rks.(D.R.)L5 14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 4.325
Allenport,Pa. P7 4.05
Ashland,Ky.(8) A10 4.05
Cleveland J5 4.05
Cleveland R2 4.325
Conshohocken,Pa. A3 4.375
Detroit(8) M1 4.15
Dravosburg,Pa. U5 4.325
Ecorse,Mich. G5 4.425
Fairfield,Ala. T2 4.325
FairlessHills,Pa. U5 4.375
Fontana,Calif. K1 5.075
Gary,Ind. U5 4.325
Geneva,Utah C11 4.425
GraniteCity,Ill. G4 4.25
Ind.Harbor,Ind. 1-2, Y1 4.325
Kokomo,Ind. C16 4.15
Lackawanna,N.Y. B2 4.325
Mansfield,O. E6 (37) 4.325
Munhall,Pa. U5 4.325
Newport,Ky.(8) N9 4.325
Niles,O. N12 4.05
Pittsburg,Calif. C11 5.025
Pittsburgh J5 4.05
Portsmouth,O. P12 4.05
Riverdale,Ill. A1 4.325
Sharon,Pa. S3 4.05
So.Chicago,Ill. W14 4.325
SparrowsPoint,Md. B2 4.325
Steubenville,O. W10 4.325
Warren,O. R2 4.325
Weirton,W.Va. W6 4.325
Youngstown Y1 4.325
Youngstown U5 4.325

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 5.625
Kokomo,Ind. C16 5.20
Niles,O. N12 4.95

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 7.20
Youngstown Y1 7.20

SHEETS, H.R. (14 Ga.&Heavier) High-Strength Low-Alloy

Cleveland R2 6.375
Cleveland J5 6.10
Conshohocken,Pa. A3 6.425
Dravosburg,Pa. U5 6.375
Ecorse,Mich. G5 6.475
Fairfield,Ala. T2 6.375
FairlessHills, Pa. U5 6.425
Fontana,Calif. K1 7.125
Gary,Ind. U5 6.375
Ind.Harbor,Ind. 1-2, Y1 6.375
Lackawanna(35) B2 6.375
Munhall,Pa. U5 6.375
Pittsburgh J5 6.10
Sharon,Pa. S3 6.10
So.Chicago,Ill. U5 6.375
SparrowsPoint(36) B2 6.375
Warren,O. R2 6.375
Weirton,W.Va. W6 6.375
Youngstown U5, Y1 6.375

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 4.30
Cleveland R2 4.925
Ind.Harbor,Ind. 1-2 4.575
Warren,O. R2 4.925

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 4.95
Cleveland R2 5.325
Cleveland J5 4.95
Conshohocken,Pa. A3 5.375
Dravosburg,Pa. U5 5.325
Ecorse,Mich. G5 5.425
Fairfield,Ala. T2 5.326
FairlessHills,Pa. U5 5.375
Follansbee,W.Va. F4 4.95
Fontana,Calif. K1 6.425
Gary,Ind. U5 5.325
GraniteCity,Ill. G4 5.15
Ind.Harbor,Ind. 1-2, Y1 5.325
Lackawanna,N.Y. B2 5.325
Mansfield,O. E6 5.325
Middletown,O. A10 4.95
Newport,Ky. N9 5.325
Pittsburg,Calif. C11 6.275
Pittsburgh J5 4.95
Portsmouth,O. P12 4.95
SparrowsPoint,Md. B2 5.325
Steubenville,O. W10 5.325
Warren,O. R2 5.325
Weirton,W.Va. W6 5.325
Youngstown Y1 5.325

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland R2 7.875
Cleveland J5 7.50
Dravosburg,Pa. U5 7.875
Ecorse,Mich. G5 7.975
FairlessHills Pa. U5 7.925
Fontana,Calif. K1 8.975
Gary,Ind. U5 7.875
IndianaHarbor,Ind. Y1 7.875
Lackawanna(37) B2 7.875
Pittsburgh J5 7.50
SparrowsPoint(38) B2 7.875
Warren,O. R2 7.875
Weirton,W.Va. W6 7.875
Youngstown Y1 7.875

SHEETS, Cold-Rolled Ingot Iron

Middletown,O. A10 5.45

SHEETS, Culvert (16 Gage)	Cu	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.50	....	
Canton,O. R2	6.50	7.10	
Dravosburg U5	5.70	....	
Fairfield T2	5.70	....	
Gary,Ind. U5	5.70	5.95	
Ind.Harbor 1-2	*6.10*	*6.35*	
Kokomo,Ind. C16	5.50	....	
MartinsFry. W10	*6.10*	....	
Newport,Ky. N9	*6.10*	*6.35*	
Pitts.,Calif. C11	6.45	....	
SparrowsPt. B2	*6.10*	....	

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10 6.75
Gary,Ind. U5 5.95
MartinsFry,O. W10 6.35

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 5.85‡
Ashland,Ky. A10 5.45*
Butler,Pa. A10 5.45†
Canton,O. R2 5.85‡
Delphos,O. N10 6.00‡
Dover,O. R1 5.85‡
Dravosburg,Pa. U5 5.85†
Fairfield,Ala. T2 5.85†
Gary,Ind. U5 5.85*
GraniteCity,Ill. G4 5.65‡
Ind.Harbor,Ind. 1-2 5.85†
Kokomo,Ind. C16 5.55‡
MartinsFerry,O. W10 5.85*
Middletown,O. A10 5.45†
Newport,Ky. N9 5.85‡
Niles,O. N12 5.45‡
Pittsburg,Calif. C11 6.00*
SparrowsPt.,Md. B2 5.85†
Steubenville,O. W10 5.85‡
Warren,O. R2 5.85†
Weirton,W.Va. W6 5.85*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Wall Casing

Fontana,Calif. K1 6.575

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg,Pa. U5 8.60
SparrowsPoint(39) B2 8.60

SHEETS, Galvannealed Steel

Canton,O. R2 6.25
Dravosburg,Pa. U5 5.85
Kokomo,Ind. C16 6.20
Newport,Ky. N9 6.25
Niles,O. N12 5.85

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 5.70

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland,Ky. A10 5.70
Butler,Pa. A10 5.70
Middletown,O. A10 5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 6.30
Niles,O.(28) R2 6.30
Weirton,W.Va. W6 6.15

SHEETS, Aluminum Coated

Butler,Pa. A10 8.625

SHEETS, Enameling Iron

Ashland,Ky.(8)A10 5.375
Cleveland R2 5.90
Dravosburg,Pa. U5 5.90
Gary,Ind. U5 5.90
GraniteCity,Ill. G4 5.575
Ind.Harbor,Ind. 1-2 5.90
Middletown,O. A10 5.375
Niles,O. N12 5.375
Youngstown Y1 5.90

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 7.375
Follansbee(23) F4 6.60
Yorkville,O. W10 7.75

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 6.25
Gary,Ind. U5 6.25
Mansfield,O., E6 6.25
Middletown,O. A10 5.85
Niles,O. N12 5.85
Weirton,W.Va. W6 6.25

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 6.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts.Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod.Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel&Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	*4.325*
Allenport,Pa. P7	4.05
Alton,Ill. L1	4.225
Ashland,Ky.(8) A10	4.05
Atlanta A11	*4.525*
Bessemer,Ala. T2	4.325
Birmingham C15	*4.325*
Bridgeport,Conn. N19	*4.625*
Buffalo(27) R2	*4.325*
Conshohocken,Pa. A3	*4.375*
Detroit M1	4.15
Ecorse,Mich. G5	*4.425*
Fairfield,Ala. T2	4.325
Fontana,Calif. K1	*5.075*
Gary,Ind. U5	4.325
Ind.Harbor,Ind. I-2, Y1	*4.325*
Johnstown,Pa.(25) B2	*4.325*
Lackawanna,N.Y.(25) B2	*4.325*
LosAngeles(25) B3	*5.075*
Milton,Pa. M18	*4.325*
Minnequa,Colo. C10	5.15
NewBritain(10) S15	*4.325*
N.Tonawanda,N.Y. B11	4.05
Pittsburg,Calif. C11	*5.075*
Portsmouth,O. P12	4.05
Riverdale,Ill. A1	*4.325*
SanFrancisco S7	5.00
Seattle(25) B3	*5.325*
Seattle N14	*5.325*
Sharon,Pa. S3	4.05
So.Chicago,Ill. W14	*4.325*
So.SanFrancisco(25) B3	*5.075*
SparrowsPoint,Md. B2	*4.325*
Sterling(1) N15	*4.325*
Sterling,Ill. N15	*4.425*
Torrance,Calif. C11	*5.075*
Warren,O. R2	*4.325*
Weirton,W.Va. W6	*4.325*
Youngstown U5	4.325

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	*7.50*
Carnegie,Pa. S18	6.70
Fontana,Calif. K1	*8.85*
Gary,Ind. U5	7.20
Ind.Harbor,Ind. Y1	*7.20*
LosAngeles B3	7.90
Newport,Ky. N9	*7.20*
Sharon,Pa. S3	6.70
So.Chicago W14	*7.20*
Youngstown U5, Y1	*7.20*

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.425
Conshohocken,Pa. A3	*6.425*
Ecorse,Mich. G5	*6.525*
Fairfield,Ala. T2	6.425
Fontana,Calif. K1	*7.525*
Gary,Ind. U5	6.425
Houston S5	*6.675*
Ind.Harbor,Ind. I-2, Y1	*6.425*
KansasCity,Mo. S5	*6.675*
Lackawanna,N.Y. B2	*6.425*
LosAngeles(25) B3	*7.175*
Seattle(25) B3	*7.425*
Sharon,Pa. S3	6.15
So.SanFrancisco(25) B3	*7.175*
SparrowsPoint,Md. B2	*6.425*
Warren,O. R2	*6.425*
Weirton,W.Va. W6	*6.425*
Youngstown U5, Y1	*6.425*

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.30
Warren,O. R2	*4.925*

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	5.75
Baltimore T6	5.75
Boston T6	6.30
Cleveland J5	5.75
Cleveland A7	6.45
Conshohocken,Pa. A3	*6.30*
Dearborn,Mich. D3	5.85
Detroit D2, M1, P20	5.85
Dover,O. G6	5.75
Ecorse,Mich. G5	*6.55*
Follansbee,W.Va. P4	5.75
Fontana,Calif. K1	*8.20*
FranklinPark,Ill. T6	5.85
Ind.Harbor,Ind. I-2	*6.55*
Ind.Harbor,Ind. Y1	*6.45*
Indianapolis C8	5.90
Lackawanna,N.Y. B2	*6.45*
LosAngeles C1	*8.50*
Middletown,O. A10	5.75
NewBedford,Mass. R10	6.20
NewBritain(10) S15	*6.45*
NewCastle,Pa. B4, E5	5.75
NewHaven,Conn. A7	7.20
NewHaven,Conn. D2	6.20
NewKensington,Pa. A6	5.75
Pawtucket,R.I. R3	6.40
Pawtucket,R.I. N8	6.30
Pittsburgh J5	5.75
Portsmouth,O. P12	5.75
Riverdale,Ill. A1	*6.55*
Rome,N.Y.(32) R6	*6.25*
Sharon,Pa. S3	5.75
SparrowsPt,Md. B2	*6.45*
Trenton,N.J.(31) R5	7.30
Wallingford,Conn. W2	6.20
Warren,O. B9, T5	5.75
Warren,O. R2	*6.25*
Weirton,W.Va. W6	*6.45*
Worcester,Mass. A7	7.30
Youngstown C8, Y1	*6.45*

STRIP, Cold-Rolled Alloy

Boston T6	12.80
Carnegie,Pa. S18	12.45
Cleveland A7	12.45
Dover,O. G6	12.45
FranklinPark,Ill. T6	12.45
Harrison,N.J. C18	12.45
Pawtucket,R.I. N8	12.80
Sharon,Pa. S3	12.45
Worcester,Mass. A7	12.75
Youngstown C8	12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5	8.60
Dearborn,Mich. D3	8.70
Dover,O. G6	8.60
Ecorse,Mich. G5	*9.40*
Ind.Harbor,Ind. Y1	*9.30*

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Boston T6	6.30	8.35	9.30	11.45	14.15
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.95	10.50	12.65	15.35
Dearborn,Mich. D3	5.85	8.25	9.20	....	....
Detroit D2	5.85	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
NewBritain,Conn.(10) S15	7.00	8.95	10.50	12.65	15.35
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
NewKensington,Pa. A6	5.75	8.05	9.00	11.15	....
NewYork W3	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill. A1	7.10	8.95	10.50	12.65	15.35
Rome,N.Y.(32) R6	7.00	8.95	10.50	12.65	15.35
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	....	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85

STRIP, Cold-Finished Spring Steel (Tempered)

Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	14.40	....	....
FranklinPark,Ill. T6	...	...	13.40	16.10	19.50
Harrison,N.J. C18	...	...	12.90	15.60	19.00
NewYork W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. A7, T6	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	14.40	....	....
Youngstown C8	...	...	13.25	15.95	19.35

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	...	*9.95*	*10.95*	*11.85*
Brackenridge,Pa. A4	...	...	9.10	10.10	11.00
Mansfield,O. E6	8.40	9.35	9.95	10.95	11.85
Newport,Ky. N9	8.40	9.35	9.95	10.95	11.85
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	...	9.35	9.95	10.95	11.85
Warren,O. R2	8.40	9.35	9.95	10.95	11.85
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)

	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	...	...	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*	8.95*	9.55*	10.55*	....
IndianaHarbor,Ind. I-2	8.60†	9.60*	10.20*	11.20*	....
Vandergrift,Pa. U5	....	9.25†	9.85†	10.85†	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.60†	10.10	10.70	11.70	12.60
Zanesville,O. A10	....	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)

	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	*12.80*	*13.35*	*13.85*	*14.85*
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	12.80	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS (22 Ga.)

	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	....
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70
Warren,O. R2	....	....	....	....	13.55‡

*Semiprocessed. †Fully processed only. ‡Coils annealed, semiprocessed ½c lower. §Coils, ¾-cent higher.

Lackawanna,N.Y. B2	*9.125*
Pittsburgh J5	8.60
Sharon,Pa. S3	8.60
SparrowsPoint,Md. B2	*9.125*
Warren,O. R2	8.60
Weirton,W.Va. W6	*9.30*
Youngstown Y1	*9.30*

STRIP, Electrogalvanized

Cleveland A7	5.75*
Dover,O. G6	5.75*
Riverdale,Ill. A1	*6.55**
Youngstown C8	5.75*
Warren,O. B9, T5	5.75*
Weirton,W.Va. W6	5.75*
Worcester,Mass. A7	6.60*

*Plus galvanizing extras.

Strip, Galvanized (Continuous)

Sharon,Pa. S3	6.15
Warren,O. B9	6.15

TIGHT COOPERAGE HOOP

Atlanta A11	4.775
Riverdale,Ill. A1	4.625
Sharon,Pa. S3	4.475
Youngstown U5	4.475

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Dravosburg,Pa. U5	7.50	7.75	8.15
Fairfield,Ala. T2	7.60	7.85	8.25
FairlessHills,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa,Pa. J5	....	....	....
Niles,O. R2	6.175	....	....
	6.175	6.375	6.575

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Dravosburg,Pa. U5	8.80	9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Pitts.Calif. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.60
Dravosburg,Pa. U5	6.60
Fairfield,Ala. T2	6.70
FairlessHills,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.70
Warren,O. R2	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5	6.20
Follansbee,W.Va. P4	6.20
Gary,Ind. U5	6.20
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	*6.65*
Yorkville,O. W10	*6.65*

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5	$7.85
Gary,Ind. U5	7.85
Yorkville W10	*6.65*

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	*6.25*
Aliquippa,Pa. J5	5.75
Alton,Ill. L1	5.925
Atlanta A11	*6.45*
Bartonville,Ill. K4	5.85
Buffalo W12	*6.25*
Chicago W13	5.75
Cleveland C20	5.75
Cleveland A7	6.25
Crawfordsville,Ind. M8	5.85
Donora,Pa. A7	6.25
Duluth,Minn. A7	6.25
Fairfield,Ala. T2	6.25
Fostoria,O.(24) S1	5.95
Houston S5	*6.50*
Jacksonville,Fla. M8	6.27
Johnstown,Pa. B2	*6.25*
Joliet,Ill. A7	6.25
KansasCity,Mo. S5	*6.50*
Kokomo,Ind. C16	5.85
LosAngeles B3	*7.20*
Minnequa,Colo. C10	6.00
Monessen,Pa. P7	5.75
Newark 6-8 ga. I-1	*6.90*
No.Tonawanda B11	5.75
Palmer,Mass. W12	*6.55*
Pittsburg,Calif. C11	*7.20*
Portsmouth,O. P12	5.75
Rankin,Pa. A7	6.25
So.Chicago,Ill. R2	*6.25*
So.SanFrancisco C10	*7.20*
SparrowsPoint,Md. B2	*6.35*
Sterling,Ill.(1) N15	*6.25*
Sterling,Ill. N15	*6.35*
Struthers,O. Y1	*6.25*
Waukegan,Ill. A7	6.25
Worcester,Mass. A7	6.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.375
Bartonville,Ill. K4	7.30
Buffalo W12	*7.90*
Cleveland A7	7.90
Donora,Pa. A7	7.90
Duluth,Minn. A7	7.90
Fostoria,O. S1	7.20
Johnstown,Pa. B2	*7.90*
LosAngeles B3	*8.85*
Milbury,Mass.(12) N6	*8.20*
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
Muncie,Ind. I-7	7.40
Palmer,Mass. W12	*8.20*
Pittsburg,Calif. C11	*8.85*
Portsmouth,O. P12	7.20
Roebling,N.J. R5	7.50
So.Chicago,Ill. R2	*7.90*
So.SanFrancisco C10	*8.85*
SparrowsPt.,Md. B2	*8.00*
Struthers,O. Y1	*7.90*
Trenton,N.J. A7	8.20
Waukegan,Ill. A7	7.90
Worcester J4, T6	7.50
Worcester A7, W12	8.20

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.90
Alton,Ill. L1	7.075
Buffalo W12	*7.60*
Cleveland A7	7.60
Donora,Pa. A7	7.60
Duluth,Minn. A7	7.60
Johnstown,Pa. B2	*7.60*
KansasCity,Mo. S5	7.50
LosAngeles B3	*8.55*
Minnequa,Colo. C10	7.075
Monessen,Pa. P7, P16	6.90
NewHaven,Conn. A7	7.90
Palmer,Mass. W12	*7.90*
Pittsburg,Calif. C11	*8.55*
Portsmouth,O. P12	6.90
Roebling,N.J. R5	7.20
So.Chicago,Ill. R2	*7.60*
So.SanFrancisco C10	*8.55*
SparrowsPoint,Md. B2	*7.70*
Struthers,O. Y1	*7.60*
Trenton,N.J. A7	7.90
Waukegan,Ill. A7	7.60
Worcester,Mass. A7	7.90

WIRE, Fine & Weaving (8"Coils)

Alton,Ill. L1	11.375
Bartonville,Ill. K4	11.30
Buffalo W12	*12.55*
Chicago W13	11.20
Cleveland A7	11.20
Crawfordsville,Ind. M8	11.30
Fostoria,O. S1	11.20
Jacksonville,Fla. M8	11.73
Johnstown,Pa. B2	11.20
Kokomo,Ind. C16	11.20
Minnequa,Colo. C10	10.95
Monessen,Pa. P16	11.20
Muncie,Ind. I-7	11.40
Palmer,Mass. W12	*12.85*
Roebling,N.J. R5	11.50
So.SanFrancisco C10	*12.90*
Waukegan,Ill. A7	11.20
Worcester,Mass. A7, T6	11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.90
Buffalo W12	*10.70*
Johnstown,Pa. B2	9.90
Minnequa,Colo. C10	10.025
Monessen,Pa. P16	9.90
Muncie,Ind. I-7	10.10
Portsmouth,O. P12	9.90
Roebling,N.J. R5	10.20
SparrowsPt.,Md. B2	10.00

ROPE WIRE (A)

Alton,Ill. L1	9.75
Bartonville,Ill. K4	9.75
Buffalo W12	9.75
Fostoria,O. S1	9.75
Johnstown,Pa. B2	*10.55*
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
SparrowsPt. B2	*10.65*
Struthers,O. Y1	*10.55*
Worcester,Mass. T6	9.65
Worcester,Mass. J4	10.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE

(Continued)

WIRE, Tire Bead

Alton, Ill. L1	13.25
Bartonville, Ill. K4	13.25
Monessen, Pa. P16	13.15
Roebling, N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson, Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	*9.00*
Cleveland A7	7.95
Crawfordsville, Ind. M8	8.05
Dover, O. G6	7.95
Fostoria, O. S1	7.95
Franklin Park, Ill. T6	8.05
Kokomo, Ind. C16	8.05
Massillon, O. R8	7.95
Milwaukee C23	8.15
Monessen, Pa. P7, P16	7.95
Pawtucket, R.I. N8	8.25
Riverdale, Ill. A1	*9.10*
Rome, N.Y. R6	*9.00*
Trenton, N.J. R5	8.25
Worcester A7, T6	8.25
Worcester, Mass. W12	*9.30*

NAIL, Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity, Ala. R2	*152*
Aliquippa, Pa. J5	137
Atlanta A11	*154*
Bartonville, Ill. K4	139
Chicago, Ill. W13	137
Cleveland A9	*157*
Crawfordsville, Ind. M8	139
Donora, Pa. A7	152
Duluth, Minn. A7	152
Fairfield, Ala. T2	152
Galveston, Tex. D7	145
Houston, Tex. S5	*157*
Johnstown, Pa. B2	*152*
Joliet, Ill. A7	152
KansasCity, Mo. S5	*157*
Kokomo, Ind. C16	139
Minnequa, Colo. C10	142
Monessen, Pa. P7	137
Pittsburg, Calif. C11	*171*
Rankin, Pa. A7	152
So. Chicago, Ill. R2	*152*
SparrowsPt., Md. B2	*154*
Sterling, Ill.(1) N15	*152*
Worcester, Mass. A7	158

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken, Pa. A3	*$9.05*
Wheeling, W.Va. W10	8.30

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
Aliquippa, Pa. J5	138
Atlanta A11	*154*
Bartonville, Ill. K4	139
Crawfordsville, Ind. M8	139
Donora, Pa. A7	152
Duluth, Minn. A7	152
Fairfield, Ala. T2	152
Johnstown, Pa. B2	*152*
Joliet, Ill. A7	152
Kokomo, Ind. C16	139
Minnequa, Colo. C10	142
Monessen, Pa. P7	137
Pittsburg, Calif. C11	*171*
Rankin, Pa. A2	152
SparrowsPt., Md. B2	*154*
Sterling, Ill.(1) N15	*152*
Worcester, Mass. A7	158

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150	
AlabamaCity, Ala. R2	$8.77
Buffalo W12	*9.35*
Donora, Pa. A7	8.77
Duluth, Minn. A7	8.77
Joliet, Ill. A7	8.77
Minnequa, Colo. C10	9.02
So. Chicago, Ill R2	8.77
Coil No. 6500 Stand.	
AlabamaCity, Ala. R2	$9.05
Buffalo W12	*9.60*
Donora, Pa. A7	9.05
Duluth, Minn. A7	9.05
Joliet, Ill. A7	9.05
Minnequa, Colo. C10	9.30
So. Chicago, Ill R2	9.05
Coil No. 6500 Interim	
AlabamaCity, Ala. R2	$9.10
Buffalo W12	*9.70*
Donora, Pa. A7	9.10
Duluth, Minn. A7	9.10
Joliet, Ill. A7	9.10
Minnequa, Colo. C10	9.35
So. Chicago, Ill. R2	9.10

BALE TIES, Single Loop

	Col.
AlabamaCity, Ala. R2	*173*
Atlanta A11	*175*
Bartonville, Ill. K4	157
Crawfordsville, Ind. M8	157
Donora, Pa. A7	173
Duluth, Minn. A7	173
Fairfield, Ala. T2	173
Joliet, Ill. A7	173
Houston S5	*178*
KansasCity, Mo. S5	*178*
Kokomo, Ind. C16	157
Minnequa, Colo. C10	160
Pittsburg, Calif. C11	179
So. San. Fran., Calif. C10	*197*
SparrowsPoint, Md. B2	*175*
Sterling, Ill.(1) N15	*173*

WIRE, Barbed

	Col.
AlabamaCity, Ala. R2	*175***
Aliquippa J5	156§
Atlanta A11	*180*
Bartonville, Ill. K4	165
Crawfordsville, Ind. M8	164
Donora, Pa. A7	175†
Duluth, Minn. A7	175†
Fairfield, Ala. T2	175†
Houston, Tex. S5	*180†*
Johnstown, Pa. B2	*179**
Joliet, Ill. A7	175†
KansasCity, Mo. S5	*180†*
Kokomo, Ind. C16	161†
Minnequa, Colo. C10	164**
Monessen, Pa. P7	162
Pittsburg, Calif. C11	*195†*
Rankin, Pa. A7	175†
So. Chicago, Ill. R2	159**
So. San Francisco C10	*195***
SparrowsPoint, Md. B2	*181**
Sterling, Ill.(1) N15	*179**

WOVEN Fence, 9-15 Ga.

	Col.
Ala. City, Ala R2	146**
Ala. City, 17 ga. R2	241**
Ala. City, 18 ga. R2	251**
Aliqppa, Pa. 9-14½ ga. J5	149§
Atlanta A11	*167*
Bartonville, Ill. K4	152
Crawfordsville, Ind. M8	151
Donora, Pa. A7	162†
Duluth, Minn. A7	162†
Fairfield, Ala. T2	162†
Houston, Tex. S5	*167†*
Johnstown, Pa. (43) B2	*166*
Joliet, Ill. A7	162†
KansasCity, Mo. S5	*167†*
Kokomo, Ind. C16	148†
Minnequa, Colo. C10	151**
Monessen, Pa. 9 ga. P17	149
Pittsburg, Calif. C11	*185†*
Rankin, Pa. A7	162†
So. Chicago, Ill R2	146**
Sterling, Ill.(1) N15	*166**

WIRE (16 Gage)	An'ld Stone	Galv. Stone
Ala. City R2	13.15	14.70**
Bartonville K4	13.25	15.15
Buffalo W12	*14.50*	
Cleveland A7	13.15	
Crawf'dsville M8	13.25	15.10
Fostoria, O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	13.25	14.80†
Minnequa C10	13.40	15.10**
Palmer, Mass W12	*14.50*	*16.05**
Pitts., Calif. C11	13.50	16.05†
So. Chicago R2	13.15	14.70
SparrowsPt. B2	13.25	15.10*
Sterling(1) N15	13.15	15.05
Waukegan A7	13.15	14.70†
Worcester A7	13.45	

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Ala. City, Ala. R2	*7.40*	*7.80***
Aliquippa J5	6.90	7.425§
Atlanta A11	*7.50*	*8.05*
Bartonville(48) K4	7.00	7.575
Buffalo W12	*7.40*	*8.80†*
Cleveland A7	7.40	
Crawfordsville M8	7.00	7.55
Donora, Pa. A7	7.40	7.80†
Duluth, Minn. A7	7.40	7.80†
Fairfield T2	7.40	7.80†
Houston, Tex. S5	*7.65*	*8.05†*
Jacks'ville, Fla. M8	7.425	7.95
Johnstown B2(48)	*7.40*	*7.975**
Joliet, Ill. A7	7.40	7.80†
KansasCity, Mo. S5	*7.65*	*8.05†*
Kokomo C16	7.00	7.40†
LosAngeles B3	*8.35*	*8.925**
Minnequa C10	7.15	7.55**
Monessen P7 (48)	6.90	7.45
Palmer, Mass. W12	*7.70*	*8.10†*
Pitts., Calif. C11	*8.35*	*8.75†*
Portsmouth, O. P12	6.90	
Rankin A7	7.40	7.80†
So. Chicago R2	*7.40*	*7.80***
So. S. Fran. C10	*8.35*	*8.75***
Spar'wsPt. B2(48)	*7.50*	*8.075**
Sterling(1)(48) N15	*7.40*	*7.975**
Struthers, O.(48) Y1	*7.40*	*7.90†*
Worcester, Mass. A7	7.70	

*Based on 12.50c zinc; †5c zinc; §10c zinc; ‡Less than 10c zinc; **Subject to zinc equalization extras.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(Base discounts, per cent off list, f.o.b. midwestern plants)

4 in. and shorter:	
½-in. & smaller diam	2
Over 4 in. through 6 in.:	
½ in. & smaller diam	+3
6 in. and shorter:	
⅝-in. and ⅝-in.	+4
¾-in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoe	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
⅜" and smaller	55
⅞" to 1¼", inclusive	58
1⅜" to 1½", inclusive	60
1⅝" and larger	55
C.P. Hex regular & heavy:	
All sizes	56
Hot Galv. Nuts (all types):	
⅜" or smaller	38
⅞" to 1½", inclusive	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	56

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)

1 in. diam x 6 in. and shorter	34
1 in. and smaller diam x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	43
Plated finishes	23

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in.	38
⅝-in. through 1 in.	15
Longer than 6 in.:	
¼-in. through ⅝-in.	20
⅝-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in. larger 9.25

⅞-in. under. List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	20.41
1¼	13	....	23.21	20.44
1½	13	21.40	25.65	22.60
1¾	13	25.28	30.31	26.71
2	13	28.33	33.97	29.93
2¼	13	31.91	38.26	33.72
2½	12	34.63	41.52	36.59
2¾	12	38.15	45.74	40.31
3	12	44.06	52.82	46.54

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer, Pa. U5	4.725	...	...	5.65
Ensley, Ala. T2	4.725	...	...	5.65
Fairfield, Ala. T2	...	...	...	5.65
Gary, Ind. U5	4.725	...	...	...
IndianaHarbor, Ind. I-2	*4.725*	*4.625*	*4.675*	
Johnstown, Pa. B2				*(16)5.65*
Lackawanna, N.Y. B2	*4.725*	*4.625*	...	*5.65*
Minnequa, Colo. C10	4.45	4.35	...	5.85
Steelton, Pa. B2	*4.725*	*4.625*	...	
Williamsport, Pa. S19	...	...	...	*5.65*

TIE PLATES

Fairfield, Ala. T2	5.625
Gary, Ind. U5	5.625
Ind. Harbor, Ind. I-2	*5.625*
Lackawanna, N.Y. B2	*5.625*
Minnequa, Colo. C10	5.275
Seattle B3	*5.775*
Steelton, Pa. B2	*5.625*
Torrance, Calif. C11	*5.775*

TRACK BOLTS (20) Treated

Cleveland R2	11.50
KansasCity, Mo. S5	11.50
Lebanon, Pa. B2	*12.40*
Minnequa, Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle B3	*12.90*

AXLES

Ind. Harbor, Ind. S13	7.25
Johnstown, Pa. B2	*7.25*

JOINT BARS

Bessemer, Pa. U5	5.825
Fairfield, Ala. T2	5.825
Ind. Harbor, Ind. I-2	*5.825*
Joliet, Ill. U5	5.825
Lackawanna, N.Y. B2	*5.825*
Minnequa, Colo. C10	5.425
Steelton, Pa. B2	*5.825*

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield, Ala. T2	7.90
Ind. Harbor, Ind. I-2, Y1	*7.90*
KansasCity, Mo. S5	*7.90*
Lebanon, Pa. B2	*7.90*
Minnequa, Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B3	*8.40*
So. Chicago, Ill. R2	*7.90*
Struthers, O. Y1	*7.90*
Youngstown R2	*7.90*

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)	Cents
Sponge iron: 98+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.l.f. N. Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N.J., in bags	9.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ¼ in. x 1.3 in.	21.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	.83.00-148.00
Aluminum:	
Atomized, 500 lb drums, frght. allowed Carlots	32.20
Ton lots	34.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	33.00-43.00†
Bronze, 5000-lb lots	54.25-57.25†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	94.00
Nickel-Silver, 5000-lb lots	49.75-57.25
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	94.00
Stainless Steel, 316	$1.25
Tin	14.50*
Zinc, 5000-lb lots	17.75-31.50‡
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh	4.30-4.40
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 29% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Dedd San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.15c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.40c for alloy and 0.45c H.S.-L.A.
(31) Widths over ⅝-in.; 6.40c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.30c.
(43) 9-14½ Ga.
(48) 6-7 Ga.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	...	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	*6.5*	*+10*	*10.5*	*+1.25*	*13*	*4.75*	*14.5*	*+3.25*	*14.5*	*+3.25*	*14*	*+3.75*	*16.5*	*+1.25*

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1'		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. F6	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless Hills, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	*17.5*	*0.25*	*20.5*	*4.25*	*23*	*7.75*	*25.5*	*9*
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	....	....	....
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Fairless Hills, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Sharon, Pa. M6	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	*26*	*10*	*26.5*	*10.5*	*28*	*10.57*	*28*	*10.75*	*18.5*	*0.75*	*18.5*	*0.75*
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (12.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. H.R. Strip	Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	17.75	22.25	....	36.75	32.00	38.00	....	44.25	41.00
302	19.00	24.75	32.00	37.25	34.50	38.25	40.25	44.50	44.50
302B	20.25	26.50	33.00	37.25	37.75	38.25	40.25	48.00	48.00
303	....	26.75	34.75	40.00	....	41.00	....	....	....
304	20.25	26.00	33.75	39.00	37.25	40.25	43.00	47.25	47.25
304L	....	....	30.00	44.25	42.50	45.50	48.25	52.50	52.50
305	21.75	28.25	....	39.50	40.25	40.25	43.50	50.25	50.25
308	22.00	29.00	38.50	44.25	41.25	45.50	49.75	52.00	52.00
309	29.50	38.25	46.75	53.50	53.50	54.75	58.25	67.00	67.00
309S	31.50	41.00	51.00	59.00	58.50	60.25	63.75	74.00	74.00
310	37.25	48.00	62.25	72.25	68.50	73.50	75.25	78.75	78.75
314	....	....	....	....	....	....	75.25	....	....
316	31.50	40.25	51.25	59.50	58.25	60.75	64.00	68.25	68.25
316L	....	....	56.50	65.00	63.50	66.00	69.50	73.50	73.50
317	37.25	48.25	62.75	72.75	73.50	74.50	77.00	83.75	83.75
321	25.00	32.00	38.25	44.00	44.25	45.25	49.25	54.25	54.25
18-8CbTa	31.00	40.50	48.75	56.25	56.25	57.00	62.00	70.50	70.50
403	....	....	28.75	32.75	....	34.00	36.25	....	....
405	17.50	23.00	26.75	31.00	32.25	32.00	33.75	42.25	42.25
410	15.00	19.50	25.50	29.50	28.00	30.50	31.75	36.25	36.25
416	....	....	26.00	30.00	....	31.00	....	....	....
420	23.50	30.25	31.00	36.00	37.75	37.25	40.75	56.00	56.00
430	15.25	19.75	26.00	30.00	28.75	31.00	32.25	36.75	36.75
430F	....	....	26.50	30.50	....	31.50	....	....	....
431	16.00	20.50	26.50	30.50	29.75	31.50	33.00	38.00	38.00
446	....	....	35.50	40.50	53.25	42.00	43.25	63.25	63.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless:			
302	....	....	28.00
304	28.30	33.60	29.75
304-L	30.30	35.50	....
310	41.30	47.00	....
316	33.40	38.80	42.75
316-L	37.80	43.30	....
316-CB	38.90	45.50	....
321	30.00	35.30	34.25
347	32.20	38.60	44.25
405	23.90	31.10	....
410	23.40	30.60	....
430	23.40	30.60	24.25
Inconel	47.90	63.90	....
Nickel	39.50	54.10	....
Monel	40.80	54.80	....
L-Nickel	41.70	58.50	....
Copper*	....	....	46.00

	Strip, Carbon Base, Cold Rolled 10%	Strip, Carbon Base, Cold Rolled Both Sides
Copper*	26.60	33.00

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.030
18.25	4.25	1	4.75	...	2.245-2.415
18	4	2	9	...	2.615
18	4	2	....	...	1.705
18	4	1	....	...	1.540
14	4	2	5	...	2.185
13.75	3.75	2	5	...	2.185
13.5	4	3	....	...	1.805
9	3.5	..	....	...	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.900

Tool steel producers include; A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
AlabamaCity, Ala. R2	*54.50*	*55.00*	....	....
Birmingham R2	*54.50*	*55.00*	....	....
Birmingham U6	....	52.88	56.50†	....
Gadsden,Ala. R2	*54.88*	*55.38*	....	....
Cincinnati, deld.	....	*60.08*	....	....
Buffalo District				
Buffalo H1, R2	*58.50*	*59.00*	*59.50*	*60.00*
Tonawanda,N.Y. W12	*58.50*	*59.00*	*59.50*	*60.00*
No.Tonawanda,N.Y. T9	....	*59.00*	*59.50*	*60.00*
Boston, deld.	*69.15*	*69.65*	*70.15*	....
Rochester,N.Y., deld.	*61.52*	*62.02*	*62.52*	....
Syracuse,N.Y., deld.	*62.62*	*63.12*	*63.62*	....
Chicago District				
Chicago I-3	*58.50*	*59.00*	*59.00*	*59.50*
Chicago R2	*58.50*	....	*59.00*	....
Gary,Ind. U5	*58.50*	....	*59.00*	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	*58.50*	*59.00*	*59.00*	*59.50*
So.Chicago,Ill. U5	*58.50*	....	*59.00*	*59.50*
Milwaukee, deld.	*60.67*	*61.17*	*61.17*	*61.67*
Muskegon,Mich., deld.	....	*65.30*	*65.30*	....
Cleveland District				
Cleveland A7, R2	*58.50*	*59.00*	*59.00*	*59.50*
Akron,O., deld.	*61.25*	*61.75*	*61.75*	*62.25*
Lorain,O. N3	*58.50*	....	....	*59.50*
Mid-Atlantic District				
Bethlehem,Pa. B2	*60.50*	*61.00*	*61.50*	*62.00*
NewYork, deld.	....	*64.78*	*65.28*	....
Newark, deld.	*63.52*	*64.02*	*64.52*	*65.02*
Birdsboro,Pa. B10	*60.50*	*61.00*	*61.50*	*62.00*
Chester,Pa. C31	....	53.50	54.00	....
Philadelphia, deld.	....	55.16	55.66	....
Steelton,Pa. B2	*60.50*	*61.00*	*61.50*	*62.00*
Swedeland,Pa. A3	*60.50*	*61.00*	*61.50*	*62.00*
Philadelphia, deld.	*62.16*	*62.66*	*63.16*	*63.66*
Troy,N.Y. R2	*60.50*	*61.00*	*61.50*	*62.00*
Pittsburgh District				
NevilleIsland,Pa. P6	*58.50*	*59.00*	*59.00*	....
Pittsburgh (N&S sides),				
Aliquippa, deld.		*60.37*	*60.37*	*60.87*
McKeesRocks, deld.		*60.04*	*60.04*	*60.54*
Lawrenceville,Homestead,				
Wilmerding,Monaca, deld.		*60.66*	*60.66*	*61.16*
Verona,Trafford, deld.	*60.69*	*61.19*	*61.19*	*61.69*
Brackenridge, deld.	*60.95*	*61.45*	*61.45*	*61.95*
Bessemer,Pa. U5	*58.50*	....	*59.00*	*59.50*
Clairton,Rankin,So.Duquesne,Pa. U5	*58.50*			
McKeesport,Pa. N3	*58.50*			*59.50*
Midland,Pa. C18	56.00	....	....	....
Youngstown District				
Hubbard,O. Y1			*59.00*	
Sharpsville,Pa. S6	*58.50*	*59.00*	*59.00*	*59.50*
Youngstown Y1			*59.00*	*59.50*
Youngstown U5	*58.50*			*59.50*
Mansfield,O., deld.	*63.40*		*63.90*	*64.40*
Duluth I-3	*58.50*	*59.00*	*59.00*	*59.50*
Erie,Pa. I-3	*58.50*	*59.00*	*59.00*	*59.50*
Everett, Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	*58.50*	*59.00*		
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	*58.50*	*59.00*		
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T3		*55.00**	*59.00*	
Toledo,O. I-3	*58.50*	*59.00*	*59.00*	*59.50*
Cincinnati, deld.	*64.26*	*64.76*		

*Low phos, southern grade. †Phos, 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	$65.00
Buffalo H1	*68.75*

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.50 Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$80.50
Keokuk,Iowa, (Open-hearth & Fdry, freight allowed K3)	86.00
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	88.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland A7 (Intermediate)	*$63.50*
Duluth I-3 (Intermediate)	*63.50*
Erie,Pa. I-3 (Intermediate)	*63.50*
Lyles,Tenn. T3	*72.50*
Steelton,Pa. B2	*66.50*
Philadelphia, deld.	*70.05*
Troy,N.Y. R2	*66.50*

Warehouse Steel Products

Representative prices, cents per pound subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Buffalo, Chicago, Milwaukee, St. Louis, 25 cents; St. Paul, 15 cents; Philadelphia, New York, Boston, San Francisco and Los Angeles, 10 cents; Atlanta, Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	Stainless Type 302	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.§	H.R. Alloy 4140††‡	Shapes	Carbon	Floor
Atlanta	6.79	7.75	8.37	43.43	7.05	...	6.92	8.89	....	7.08	7.09	8.83
Baltimore	7.03	8.32	9.00	....	7.65	...	7.61	8.62*	12.54	7.93	7.21	8.87
Birmingham	6.70	7.80	8.85	....	6.95	...	7.00	9.35	....	7.20	7.05	9.10
Boston	7.23	8.23	9.57	45.28*	7.47	...	7.20	8.60	12.60	7.49	7.37	8.50
Buffalo	6.30	7.40	8.88	....	6.65	...	6.45	7.40	12.30	6.67	6.60	7.85
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.80	7.93	8.50	46.05	7.06	...	7.08	7.75	12.85	7.28	6.99	8.46
Cincinnati	6.49	7.37	8.35	46.10	6.86	...	6.75	7.55	12.30	6.86	6.81	7.89
Cleveland	6.38	7.38	8.30	46.16	6.72	...	6.57	7.35	12.11	7.02	6.69	7.81
Detroit	6.57	7.57	8.63	43.50	6.90	7.36	6.79	7.54	12.25	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45*	....	6.69	6.52	7.64
Houston	7.35	7.80	9.99	....	7.70	9.30	7.70	9.30	....	7.60	7.35	8.75
Los Angeles	7.50	9.25	10.00	50.75	7.85	11.85	7.45	10.15	13.45	7.65	7.45	9.55
Milwaukee	6.89	8.02	8.59	....	7.15	...	7.17	7.94	12.94	7.45	7.08	8.55
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.60	....	7.04	6.87	...
New York	7.46	8.68	9.44	44.95	8.07	...	7.96	8.48	13.28	7.99	7.76	9.19
Norfolk, Va.	7.25	...	....	....	7.65	...	7.65	9.50	....	7.95	7.45	8.95
Philadelphia	7.14	8.42	9.35	45.98	7.67	9.02	7.64	8.46	13.16	7.74	7.37	8.69
Pittsburgh	6.38	7.38	8.30	46.00	6.72	...	6.51	7.35	12.05	6.69	6.52	7.64
Portland, Oreg.	7.00	7.75	9.10	48.50	7.25	...	7.05	10.20	14.00	7.00	6.85	8.75
Richmond, Va.	7.00	...	9.47	....	7.65	...	7.70	8.85	....	7.95	7.20	9.10
St. Louis	7.09	8.22	9.19	43.89	7.35	...	7.37	8.14	13.14	7.68	7.28	8.76
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.01	....	7.35	7.18	8.30
San Francisco	8.10	9.55	9.90	51.65	8.35	...	8.05	11.30	15.15§	8.25	8.05	10.25
Seattle	8.55	10.40	10.80	54.00	8.65	...	8.35	11.70	14.60	8.30	8.20	10.10
Spokane	8.35	9.65¶	10.20	....	7.80	...	7.80	10.85‡‡	14.55	7.45	7.55	9.60
Washington	7.50	8.79	7.97	....	8.12	...	8.08	9.09	....	8.40	7.68	9.34

*Prices do not include gage extras; †prices include gage and coating extras, except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **¼-in. and heavier; ††as annealed; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 999 lb and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [2]—500 to 9999 lb; [3]—400 to 999 lb; [4]—4000 lb and over; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 to 3999 lb; [8]—2000 to 3999 lb; [9]—f.o.b. local delivery in lots of 10,000 lb and over.

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NEA

Red Metal Rides Housing Boom

IF THERE WERE more markets for copper like the residential nonfarm construction market, producers would be having an even harder time meeting the demand for the red metal.

About 384,000 tons of copper may go into new homes this year (see table) if the market is cultivated properly and the metal is available. In fact, if coppermen could achieve 100-per-cent saturation wherever the use of copper is indicated, the market potential would be in the neighborhood of 1,359,000 tons—more than was used by all consumers in 1954. That will not happen, but it indicates copper demand in this industry likely will remain high.

Problems—Unstable production and price have prevented the industry from promoting its metal to the fullest extent over the past several years. This has led to substitution of other materials. In addition, some of copper's market has been sacrificed to design—the modern ranch-type house with its overhanging roof requiring less gutters and downspouts than the traditional two-story homes of a few years back.

But for each pound lost, there are opportunities to gain another pound of copper. One of the healthiest potentials is in house wiring. Copper producers, wire fabricators, contractors and utilities companies are pushing a campaign for more adequate wiring. They believe this is one market where copper is king. If every home were to have adequate wiring instead of the minimum requirements, the demand for copper products in this category alone would be from 15 to 20 per cent greater. And this is a field in which modernization plays as big a part as new construction, if not bigger.

Hot Market—Another good possibility for increased use of the red metal is in radiant heating. While the figures in the table include only ceiling installations, it is estimated that 14 per cent of all homes being built today have ceiling or floor installations (or both) of radiant heating tubes. Inasmuch as each installation requires perhaps 500 lb or more of copper tubing, depending on the size of the home, even a small increase in the saturation of this market would amount to a fairly sizable increase in the tonnage used.

In past years, appliances were considered a market in themselves. But as designers have included more of them as built-in features, they have become closely identified with the housing boom. Not only are there more homes for these modern conveniences, but there are more appliances for the homes. Most of them include a heating element or a motor of some kind, and they use copper. By promoting the use of such appli-

Copper's Stake in Residential Construction

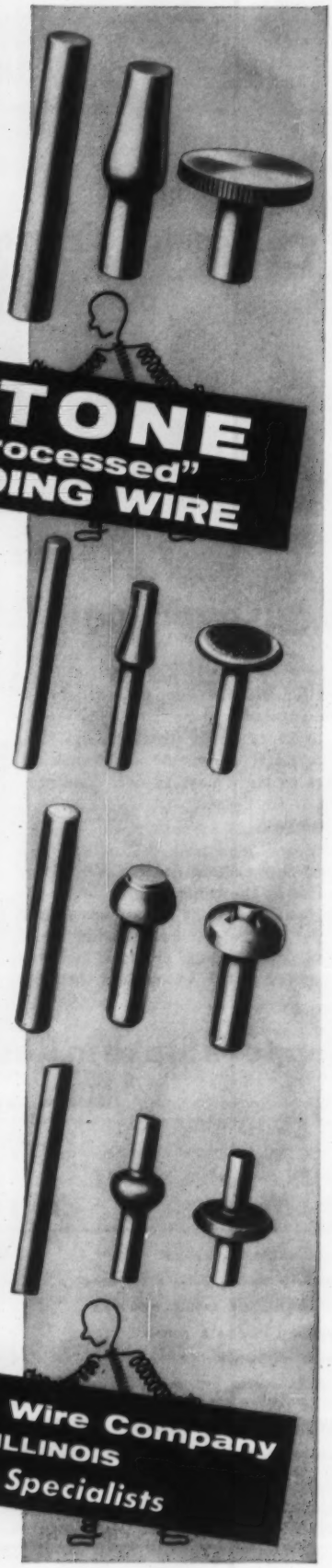
(Modern six-room house)

	Pounds of Copper, Min. Construction	Degree of Saturation, Per cent	Est. 1955 Consumption, Pounds*
Water distribution system	135	50	87,750,000
Plumbing, wastes, vents & soil lines	175	5	11,375,000
Radiant heating, ceiling installation	725	5	47,125,000
Flashings, leaders & gutters	480	50	312,000,000
Termite protection	270	2	7,020,000
Electrical wiring, incl. service entrance & fixtures, switches & outlets	110	100	143,000,000
Screens & builders' hardware	95	50	61,750,000
Appliances, permanent & movable, and misc. hardware, furniture & decorative uses	100	75	97,500,000

*Based on residential nonfarm construction rate of 1.3 million units.

Sources: Copper & Brass Research Association; STEEL.

Wire that's *BEST* for difficult cold heading



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ances, the copper industry is further increasing its stake in the housing boom.

Competition—In practically every application, other metals such as aluminum, tin and galvanized steel will continue to put the pressure on copper for these markets. But as long as it's available, copper will find a sizable market in homebuilding.

Tin Plate . . .

Tin Plate Prices, Page 152

Canmakers want all the tin plate they can get, despite the fact they had been taking expanded tonnages into their plants as a strike hedge. This doesn't reflect increased consumption entirely, rather it also stems from anticipation of higher prices in October.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 151 & 152

Impact of the recent price advances on sheet demand probably will not be known fully for a few days pending clarification of the over-all market picture. Meanwhile, the steelmakers generally expect to know this week if September rollings will be fully committed, since July 15 is the closing date on lead-time.

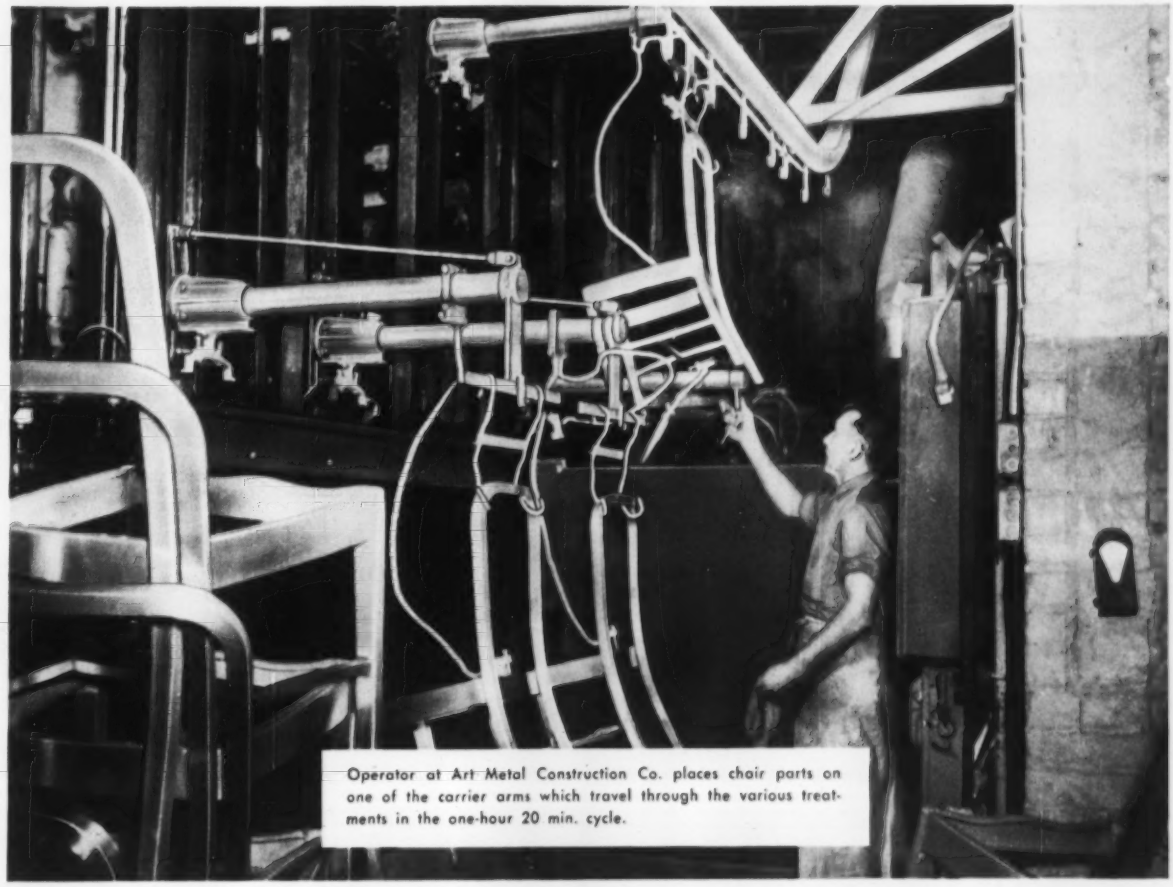
Generally, the price advances were greater than had been expected in the trade. As a result, some consumers are inclined to take a second look at their requirements, although no cutbacks of note have come through to the mills as yet.

For the most part the price increases were uniform among the various producers. One exception appears to be cold-rolled carbon strip. The general advance on that product was $14 a ton, but at least two producers posted an increase of only $10 and several others have yet to name their prices.

While demand currently is strong and most sellers are beginning offically to enter orders for shipment in the last three months, some easing in requirements may develop before end of the summer, especially in automotive needs. Several auto orders for late third quarter and early fourth quarter have been received, however. They show no decline from what had been anticipated.

Even though some slackening should be experienced there seems to be plenty of tonnage on hand to keep producers busy throughout third quarter. In fact, most mills will enter fourth quarter with arrearages. Consequently, some makers think they will have to blank out October production to care for the overflow.

(*Please turn to page* 163)



Operator at Art Metal Construction Co. places chair parts on one of the carrier arms which travel through the various treatments in the one-hour 20 min. cycle.

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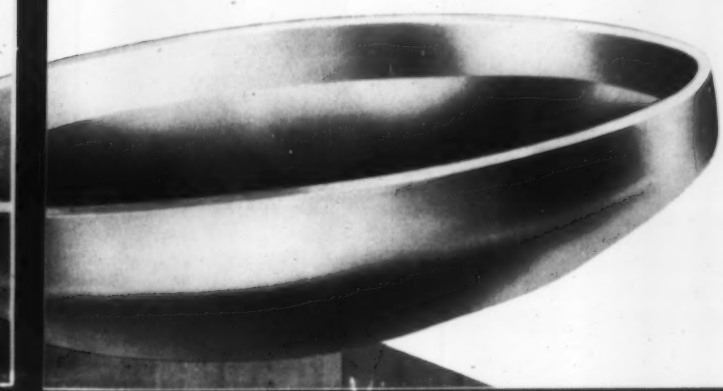

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(*Concluded from page* 158)

Several Pittsburgh mills are reported not taking September shipment orders.

Steel Bars . . .

Bar Prices, Page 150

Bar mill rolling schedules currently are on a cycle of about 60 days compared with the normal 30 days. The longer cycle has advantages for the barmakers, but there are disadvantages for consumers.

Tonnage lost during the short-lived steel strike at the opening of this month caused Pittsburgh area producers to fall further behind on deliveries. Supplies were already tight, especially hot-rolled, when the strike hit the industry. Deliveries at that time were running two to four weeks late. Now the situation is worse, and further tightening is expected as hot weather slows down production.

Some consumers are turning to the warehouses for supplies with mill shipments delayed. This is not general, however. Most users are reluctant to pay warehouse prices unless absolutely necessary. Further, vacation slackening of general manufacturing operations should serve to ease supply conditions to some extent over the summer.

Indications are strong demand will be encountered through the remainder of the year. The higher prices now in effect are not expected to influence demand adversely. Currently, Chicago district sellers report farm equipment manufacturers are taking all the steel the mills are allotting them.

That some producers are over-sold on hot-rolled carbon bars was indicated last week in New England by the realignment of orders already on books and setbacks on some orders by one month. In one case, September orders have been rescheduled for October while third quarter schedules are revised to what amounts to a return to allocation.

The situation in cold-finished is not quite as stringent in the area, but it is becoming serious. Numerous consumers in the district covered too late for both second and third quarters and are on the tailend on most mill schedules. Alloy bars are more active.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 150

Rolling mill operations in the Pacific Northwest were only slightly affected by the recent steel strike. Consequently little reinforcing bar tonnage was lost in the district.

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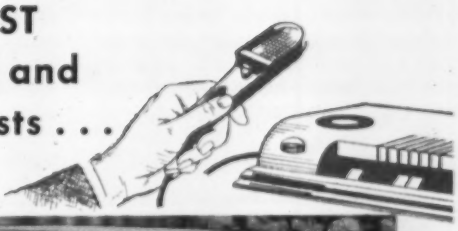

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Pacific Steel Rolling Mills Inc. Seattle, which ceased operation some time ago, have been sold to the Oregon Steel Mills and will be brought into that firm's Portland plant.

Plates . . .

Plate Prices, Page 150

Plate fabricators in New England are experiencing difficulty in placing orders beyond October except for tonnage to meet specific contracts. Demand for small tanks has been in excess of expectations and volume continues high. In this tight plate position, little help is forthcoming from Pittsburgh. The leading producer is not equalizing freight and consumers are willing to pay the higher price with few openings in mill rolling schedules. Shipbuilding needs will be heavier in the district in fourth quarter.

While the recent price advances on plates were a little higher than had been expected in the trade, consumers generally are taking the increases in stride.

The general rise of $5.50 a ton on sheared plates appears to have had no adverse effect on demand as producers began to open their order books for shipments beyond September. In some cases the mills are not booking beyond October, and all of them are accepting forward tonnage orders cautiously. Some are doubtful if they will become current on shipments before the end of October.

A little sheared tonnage might still be worked in for third quarter delivery, but, in general, the platemakers are now out of the market for that delivery period on this grade. Universal plates, however, can still be had for early August.

Ingalls Shipbuilding Corp., Gulf Port yard, will build two of eight 25,000-ton tankers for the Military Transport Service. Initial plate requirements are in late fourth quarter.

Jones & Laughlin Steel Corp. established a price differential for carbon steel plates shipped from its Cleveland Works Division, effective July 8. The differential amounts to 10 cents per 100 pounds, or $2 per net ton, over the base price established for the same product shipped from the Pittsburgh and Aliquippa Works Divisions of the company. New base prices quoted by the company are: Aliquippa, $4.50; Pittsburgh, $4.50; Cleveland, $4.60. Floor plates are quoted at Cleveland, $5.575.

Wire . . .

Wire Prices, Pages 152 & 153

Wire rod schedules are filled through third quarter in New England and users of finished wire are placing more forward volume. Some New England producers are sold out for third quarter on specialties, while August is practically taken up on all products. Heading wire users are covered into September.

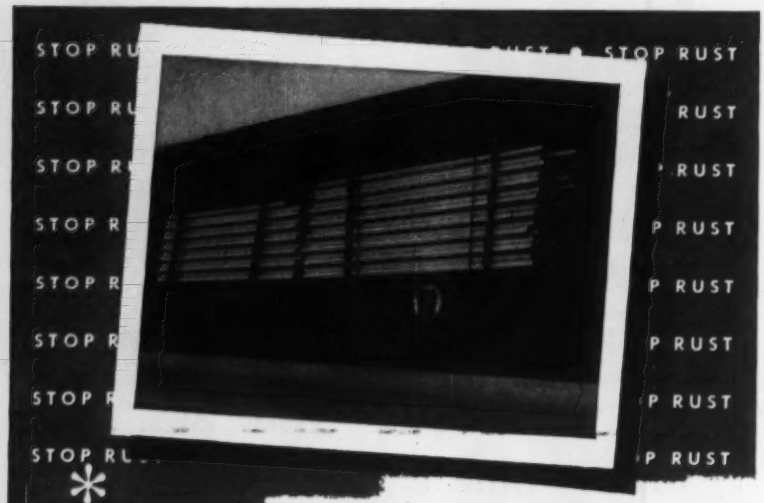
Buyers of manufacturers wire and specialties are placing orders farther ahead in New England, recognizing the need for more lead time. Some mill schedules are now filled through September on more specialties, including stainless.

Bedding and upholstery wire demand is heavier, orders usually placed in August reportedly already coming to the mills.

Where specialties require considerable processing some fourth quarter volume has been placed. Forward buying of rods also is heavier.

Wiremakers are meeting delivery promises better than producers of other finished steel products.

Springmakers are confronted with the problem of passing along an average price advance of $14 per ton on high carbon steel grades under highly competitive market conditions.



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Users of manufacturers coarse bright low carbon wire are now paying higher prices, $10 per ton higher on a Worcester, Mass., base.

Tubular Goods . . .

Tubular Goods Prices, Page 154

Price advances ranging up to $16.75 per net ton have been placed in effect since July 6 by most pipe producers, following the granting of an average 15 cents per hour wage increase to the steelworkers. Initial price action was taken by U. S. Steel Corp. and was promptly followed by most other makers.

Buttweld standard pipe prices are up $10.50 to $14 per ton, seamless standard pipe $11.50 to $15.50, seamless and electric weld line pipe $8 to $11, oil country casing $11.60, oil country tubing $15, drill pipe $16.75 and seamless pressure and mechanical tubing 8 per cent on carbon and 6.5 per cent on alloy.

Third quarter demand outlook continues bright. Supply conditions in the pipe market, however, are not so tight as they are in bars, plates and sheets. Both seamless and buttweld production is rising now, but is expected to level out soon. Demand for oil country tubing should continue heavy throughout the summer.

Cast iron pipe requirements of municipalities continue heavy.

Pacific Gas & Electric Co., San Francisco, plans to enlarge its natural gas transmission facilities. A $24 million program includes 189.8 miles of additional pipeline between Topock, Ariz., and Milpitas, Calif.

Structural Shapes . . .

Structural Shape Prices, Page 150

Fabricated structural steel costs appear slated for an increase of about $12 a ton as result of the general advance of $7 on structural shapes and an estimated rise of $5 a ton in structural shop labor costs. Such an increase in labor costs has already gone into effect at some shops.

Higher fabricated steel prices may cause delay, if not abandonment, of some work now under consideration. This may be particularly true of certain public works planned under limited appropriations. Also, there may develop a swing to concrete construction on such work as schools and institutional buildings. Further, private builders may give their programs a second look before taking definite action.

It is too early, however, to appraise the precise effect of the higher prices. Except in the Pacific Northwest, fabricators are booked well ahead and they anticipate a heavy volume of new work. Inquiry still holds at a high level, one new job involving 5000 tons for an insurance building at Worcester, Mass.

The increase in prices on plain material caught most eastern fabricators uncovered on tonnage against firm fabricating contracts taken at prices in effect prior to the recent advance. This includes a substantial part of 60,000 tons for the Massachusetts turnpike. Even at the old prices, numerous shops had booked at bargain prices and now they must cover at least part of their requirements at a higher level, $4.65, mill. Their margin, as a result, will be paper-thin.

In the New York market business is humming. Considerable tonnage is being figured. New York Board of Transportation has revised plans for reconstruction of the DeKalb avenue station in Brooklyn.

Fabricators' bids reflect the $7 increase on standard and wide flange beams. Actually, the Phoenixville, Pa., producer's price is up $9 a ton on standard shapes to a parity with other sellers. It had been quoting $2 under the market.

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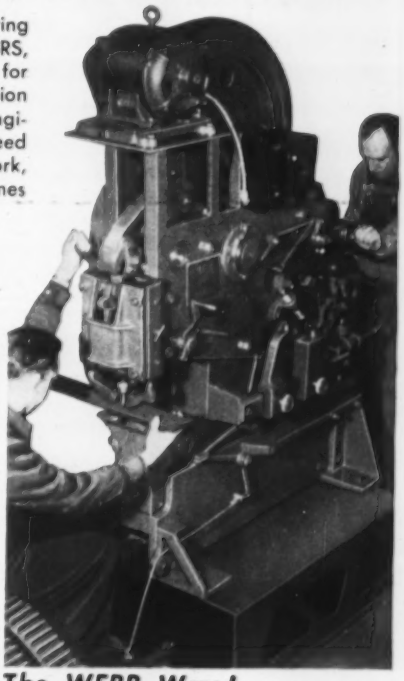

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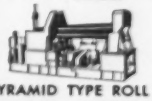
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Semifinished Steel . . .

Semifinished Prices, Page 150

Sharon Steel Corp., Sharon, Pa., will build a $13,500,000 blooming mill at its Roemer Works, Farrell, Pa.

Ingot production has snapped back from the recent short-lived steel strike. The national ingot rate this week is estimated at 93 per cent of capacity. At Pittsburgh, operations were up 3 percentage points from a week ago to 94 per cent. This represents a rise of 19.5 points since two weeks ago.

Steelmakers in the Chicago area point out that as a result of the recent strike more finished rolled steel than ingot is being lost currently. This is because finishing facilities were required to be down longer for lack of power and fuel. Because many of these facilities had been running at full capacity no recouping of the lost production is possible now.

Stainless Steel . . .

Stainless Steel Prices, Page 154

U. S. Steel Corp. plans installation of facilities for production of continuous cold-rolled light and heavy gage stainless sheets and strip at its Vandergrift, Pa., plant. Also, it plans increasing capacity for these products at its Gary (Ind.) sheet and tin mill.

Stainless steel prices and some extras are on a higher level as result of action by producers since July 6 following the granting of a wage advance to the steelworkers. First announcement on prices came from U. S. Steel Corp. subsidiaries. Since then other makers have issued revised lists.

The increases are not expected to adversely affect demand, which continues heavy. Producers are hampered by the nickel shortage which is restricting mill production in some cases. Third quarter demand outlook is promising.

Warehouse . . .

Warehouse Prices, Page 155

Reflecting mill advances, warehouse prices are moving higher throughout the list. New schedules are not complete at all points, but distributors indicate they will be issued soon. Prices on carbon steel products have been advanced up to $12.50 a ton on some items. Delivery prices are higher in some cities.

Demand for steel out of warehouse is brisk, although unusually hot weather and vacations at various metalworking plants have reduced demand slightly.

There is a tendency for some large steel users who have been augmenting their supplies through warehouse acquisitions to hold up on these orders currently in hope they are going to be able to get more steel from the mills. So far there are no prospects mills will be able to provide more.

Warehouse stocks are not excessive. In fact, they are light considering the sustained rate of high demand. In some districts they are becoming less balanced. More orders are being placed with mills to correct the situation.

Steel Output Sets Records

Steel production was record-breaking for June and second quarter, reports the American Iron & Steel Institute. June output totaled 9,735,000 net tons of ingots and steel for castings and that for second quarter was 29,878,411 tons. The previous quarterly record was 28,998,839 tons produced in the first quarter of 1953.

Production for the first half amounted to 57,194,835 net tons. Only one other six-month total has been larger, the 57.9 million tons produced in the first half of 1953. Output in the like period last year was 44,131,632 tons.

The June index of steel production (1947-1949 equals 100) was 141.4, comparing with 145.2 in May when the furnaces poured 10,328,316 tons, the greatest monthly tonnage in history. The index for the second quarter was 143.1, comparing with 132.2 in first quarter and 104.4 in second quarter a year ago. The index for the first six months was 137.7 against 106.2 a year ago.

June production was at 94 per cent of the Jan. 1, 1955, capacity, rated at 125,828,310 net tons. The average for the second quarter was 95.2. Output for the first six months was at the rate of 91.6 per cent of capacity, comparing with 71.5 per cent a year ago when capacity was rated at only 124.3 million tons.

Detailed data are given in the following table.

	OPEN HEARTH			BESSEMER			ELECTRIC			TOTAL			Calculated weekly production	Number of weeks
Period	Net tons	Per cent of capacity	‡Index	Net tons	Per cent of capacity	‡Index	Net tons	Per cent of capacity	‡Index	Net tons	Per cent of capacity	‡Index	(Net tons)	in month
1955														
January	8,054,345	86.0	125.7	199,229	49.0	56.7	584,162	63.6	163.6	8,837,736	82.7	124.2	1,994,974	4.43
February	7,734,884	91.5	133.7	197,091	53.7	62.1	564,959	68.1	175.1	8,496,934	88.0	132.2	2,124,233	4.00
March	9,060,026	96.7	141.4	256,493	62.8	72.7	666,235	72.6	186.5	9,981,754	93.4	140.3	2,253,281	4.43
1st Quarter	24,849,255	91.4	133.6	651,813	55.2	63.9	1,815,356	68.1	175.1	27,316,424	88.0	132.3	2,124,139	12.86
April	8,858,549	97.7	142.9	275,069	69.8	80.9	681,477	76.6	197.2	9,815,095	94.8	142.6	2,287,901	4.29
*May	9,307,291	99.4	145.3	305,347	75.1	86.9	715,678	77.9	200.4	10,328,316	96.6	145.2	2,331,448	4.43
†June	8,761,000	96.6	141.3	284,000	72.1	83.5	690,000	77.6	199.6	9,735,000	94.0	141.4	2,269,000	4.29
†2nd Quarter	26,926,840	97.9	143.2	864,416	72.4	83.8	2,087,155	77.4	199.1	29,878,411	95.2	143.1	2,296,573	13.01
†1st 6 Months	51,776,095	94.7	138.4	1,516,229	63.8	73.9	3,902,511	72.8	187.1	57,194,835	91.6	137.7	2,210,856	25.87
1954														
January	7,256,526	78.3	113.3	260,453	64.0	74.1	434,507	48.9	121.7	7,951,486	75.3	111.8	1,794,918	4.43
February	6,523,213	77.9	112.8	174,253	47.4	54.9	385,771	48.1	119.6	7,083,237	74.3	110.2	1,770,809	4.00
March	6,649,667	71.7	103.8	207,726	51.1	59.1	432,207	48.7	121.0	7,289,600	69.0	102.5	1,645,508	4.43
1st Quarter	20,429,406	75.9	109.9	642,432	54.4	63.0	1,252,485	48.6	120.8	22,324,323	72.8	108.1	1,735,960	12.86
April	6,365,326	70.9	102.7	162,657	41.3	47.8	442,954	51.5	128.2	6,970,937	68.1	101.3	1,624,927	4.29
May	6,817,951	73.6	106.4	198,063	48.7	56.4	456,724	51.4	127.9	7,472,738	70.7	105.0	1,686,848	4.43
June	6,702,006	74.7	108.1	207,666	52.7	61.1	453,962	52.8	131.3	7,363,634	72.0	107.0	1,716,465	4.29
2nd Quarter	19,885,283	73.1	105.8	568,386	47.6	55.1	1,353,640	51.9	129.1	21,807,309	70.3	104.4	1,676,196	13.01
1st Half	40,314,689	74.5	107.8	1,210,818	51.0	59.0	2,606,125	50.3	125.0	44,131,632	71.5	106.2	1,705,900	25.87
July	6,040,120	65.3	94.3	205,313	50.8	58.4	382,164	43.1	107.0	6,627,597	62.9	93.2	1,499,456	4.42
August	6,021,496	65.0	94.0	217,837	53.6	62.0	427,574	48.2	119.7	6,666,907	63.1	93.7	1,504,945	4.43
September	6,140,266	68.6	99.1	214,065	54.5	63.6	453,152	52.8	131.1	6,807,483	66.7	98.9	1,590,533	4.28
3rd Quarter	18,201,882	66.3	95.8	637,215	52.9	61.1	1,262,890	48.0	119.1	20,101,987	64.2	95.2	1,530,997	13.13
9 Months	58,516,571	71.7	103.7	1,848,033	51.6	59.7	3,869,015	49.5	123.0	64,233,619	69.1	102.5	1,647,016	39.00
October	6,973,568	75.2	108.9	237,754	58.5	67.7	490,211	55.2	137.3	7,701,533	72.9	108.3	1,738,495	4.43
November	7,307,151	81.4	117.9	231,191	58.7	68.0	551,085	64.1	159.4	8,089,427	79.1	117.5	1,885,847	4.29
December	7,530,204	81.4	117.6	231,126	57.0	65.8	525,743	59.4	147.2	8,287,073	78.6	116.5	1,874,903	4.42
4th Quarter	21,810,923	79.3	114.7	700,071	58.0	67.1	1,567,039	59.5	147.8	24,078,033	76.8	114.0	1,832,423	13.14
2nd Half	40,012,805	72.8	105.2	1,337,286	55.4	64.1	2,829,929	53.8	133.5	44,180,020	70.5	104.6	1,681,767	26.27
Total	80,327,494	73.6	106.5	2,548,104	53.2	61.6	5,436,054	52.0	129.3	88,311,652	71.0	105.4	1,693,741	52.14

Note—The percentages of capacity operated are calculated on weekly capacities in 1955 of 2,114,196 net tons hearth, 91,810 net tons bessemer and 207,272 net tons electric ingots and steel for castings, total 2,413,278 net tons; based on annual capacities as of Jan. 1, 1955, as follows: Open hearth 110,234,160 net tons, bessemer 4,787,000 net tons, electric 10,807,150 net tons, total 125,828,310 net tons.

Note—The percentages of capacity operated are calculated on weekly capacities in 1954 of 2,092,342 net tons open hearth, 91,810 net tons bessemer and 200,397 net tons electric ingots and steel for castings, total 2,384,549 net tons; based on annual capacities as of Jan. 1, 1954, as follows: Open hearth 109,094,730 net tons, bessemer 4,787,000 net tons, electric 10,448,680 net tons, total 124,330,410 net tons.

*Revised. †Preliminary figures, subject to revision. ‡Index of production based on average weekly production of the three years 1947-1948-1949.

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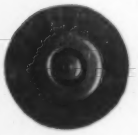

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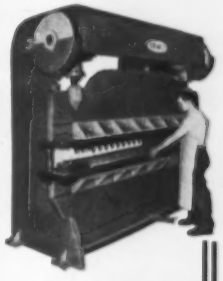

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- **lastingly beautiful surface effects!** Vinyl can be given practically any color, in many finishes, including leather-like grains, marble patterns, prints, weave-like designs.
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Ores

Lake Superior Iron Ore

(Prices effective for the 1955 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$10.40
Old range nonbessemer	10.25
Mesabi bessemer	10.25
Mesabi nonbessemer	10.10
Open-hearth lump	11.25
High phosphorus	10.00

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68%	20.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	24.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$31.50-$32.00
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 85c-87c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, 75c-80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$52.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	31.00-32.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

56-60%	$3.50-$3.80
60-65%	3.80-4.25

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $114; Salina, Pa., $119; Niles, O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., Niles, O., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa. $130; Philadelphia, $116; Woodbridge, N. J., $114.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Perla, Ark., $109; Los Angeles $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $258; Clearfield, Pa., $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $148.50; St. Louis, $159.30; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.80.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, dead-burned, bulk, ¼-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.50
Camden, N. J., ovens	24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, Ind., ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	24.00
Swedeland, Pa., ovens	24.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	24.25
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net tons, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

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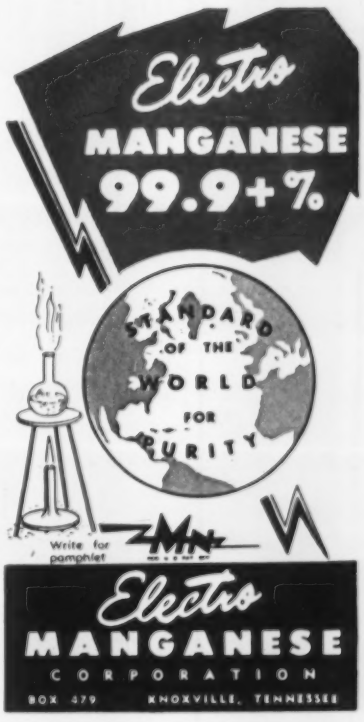
Diam (Inches)	Length (Inches)	Per 100 lb
2	24	$47.75
2½	30	30.75
3	40	30.00
4	40	28.50
5⅛	40	28.25
6	60	25.50
7	60	25.25
8, 9, 10	60	22.75
12	72	26.00
14	60	22.50
16	72	21.50
17	60	22.00
18	72	21.50
20	72	21.25

CARBON

8	60	11.40
14, 12, 10	60	11.10
14	72	10.25
17	60	10.25
17	72	9.85
20	84	9.85
20	90	9.65
24	72, 84	9.85
24	96	9.60
30	84	9.75
40,35	110	9.50
40	100	9.50



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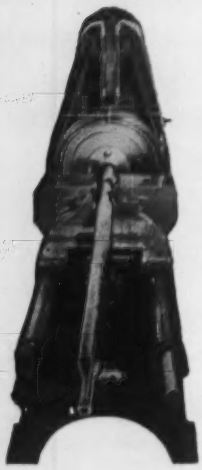

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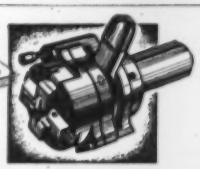

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Scrap . . .

Scrap Prices, Page 168

Philadelphia—Steel scrap prices are strong. There has been little test of the market on the major open-hearth grades, but sellers are paying as much, if not more, than they had received on recent orders to cover them. Nominally the market is now $39-$40, delivered, on No. 1 heavy melting, No. 1 bundles and No. 1 busheling; $34-$35 on No. 2 heavy melting and $30-$31 on No. 2 bundles. Other steel grades are unchanged.

Momentarily the cast grades also are unchanged, but sentiment has been strengthened by the advance in pig iron prices and by fairly brisk consumption. The strike at the Florence, N. J., pipe foundry has ended. This may be reflected soon in higher prices for No. 1 cupola cast.

New York—Scrap brokers are holding their buying prices on steel grades unchanged, but they have advanced their offerings for No. 1 cupola to $32-$33, and for unstripped motor blocks to $22-$23.

Stainless steel scrap prices are decidedly strong, although the situation in the market is somewhat unsettled. At the moment, brokers are offering $245-$250 for 18-8 sheets, clips and solids, and $120-$125 for 18-8 borings and turnings. They have also advanced buying prices on type 430 sheets, clips and solids to $105-$110, and on type 410 sheets, clips and solids to $85-$90.

Boston—Heavy melting steel scrap prices are higher, the advance on No. 1 being greater than on No. 2. As a result, the usual differentials between the grades are widening. Industrial scrap, borings and turnings are slightly stronger, but lack the strength shown in the heavier grades. Cast iron grades are soft.

Pittsburgh — On July 12 a large consumer made its first major purchase of scrap for Pittsburgh-area mills since the end of steel wage negotiations. The purchase, considered "larger than average," confirmed reports of growing strength in scrap locally. Steelmakers are planning heavy operations in early third quarter, and it's impossible to buy scrap at last month's lower prices.

Last week's purchase was of No. 1 heavy melting scrap at $40, No. 2 heavy melting at $37 and No. 2 bundles at $34. No. 1 and No. 2 heavy melting scrap had been bought at prices $1.50 a ton lower a week earlier by brokers.

Cleveland — Although representative sales are lacking, the scrap market tone here is strong. This partly reflects bullishness stemming from the higher finished steel and pig iron prices and prospects for continued high-level steelmaking operations over coming months. Also a factor for strength is reduced scrap generation during the vacation season. Prices are unchanged.

Buffalo — Prices on steelmaking grades of scrap soared $4.50 to $5 a ton here last week on buying by leading area mill consumers. Orders were placed for approximately 15,000 tons. Dealers' sentiment was buoyed by the rise, prices now being considered in line with those quoted at other consuming centers. Other grades followed steel upward, prices rising $1 to $3 per ton.

Detroit—Scrap prices advanced here last week with No. 1 heavy melting quoted $32, No. 2 heavy melting $23, No. 1 bundles $33, No. 2 bundles $21.50, No. 1 busheling $32, machine shop turnings $15, mixed borings and turnings $15, short shovel turnings $19.50 and punchings and plate scrap $36.

The higher prices reflect a slowing down in auto production, lessening the supply of scrap.

Birmingham—The steel scrap market is at a virtual standstill. At the same time cast iron grades are moving sluggishly. The steel mills appeared to be well supplied. Dealers report limited tonnage is moving into yards.

Cincinnati—Prices continue to edge upward. Additional purchasing by a local mill is expected. Major changes last week were: Machine shop turnings up $1 to $20-$21; short shoveling turnings, up $1 to $23-$24; mixed borings, up 50 cents to $20-$21.

Chicago—Although some important mills in this area are not buying scrap currently, prices on several top steelmaking grades have advanced another $1 per ton. There has been question whether some of the current quotations represent consumer buying or reflect stronger broker-dealer transactions. This point, however, was practically cleared up when a leading mill announced these prices it would pay: No. 1 industrial heavy melting steel, $38; No. 1 factory bundles, $39; low phos, 2-ft lengths, $40.

Los Angeles—More than 20,000 tons of steelmaking scrap are scheduled to move through the port of San Diego over the next 12 months. Most of the material, first to be shipped through San Diego in 15 years, comes from Arizona, New.

(*Please turn to page* 174)

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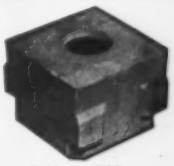

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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

July 13	$38.67
July 6	37.83
June Avg.	35.44
July 1954	27.42
July 1950	37.04

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer's plant)

No. 1 heavy melting	*39.00-40.00*
No. 2 heavy melting	*36.00-37.00*
No. 1 bundles	*39.00-40.00*
No. 2 bundles	*33.00-34.00*
No. 1 busheling	*39.00-40.00*
Machine shop turnings	20.50-21.50
Mixed borings, turnings	20.50-21.50
Short shovel turnings	25.00-26.00
Cast iron borings	25.00-26.00
Cut structurals, 5 ft lengths	38.00-39.00
Heavy turnings	33.00-34.00
Punchings & plate scrap	*40.00-41.00*
Electric furnace bundles	*40.00-41.00*

Cast Iron Grades

No. 1 cupola	39.00-40.00
Charging box cast	34.00-35.00
Heavy breakable cast	34.00-35.00
Unstripped motor blocks	25.00-26.00
No. 1 machinery cast	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt	38.00-39.00
Rails, 2 ft and under	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Rails, random lengths	45.00-46.00
Railroad specialties	43.00-44.00

Stainless Steel Scrap

18-8 bundles & solids	240.00-250.00
18-8 turnings	110.00-120.00
430 bundles & solids	100.00-105.00
430 turnings	60.00-65.00

CLEVELAND

(Delivered consumers's plant)

No. 1 heavy melting	34.50-35.50
No. 2 heavy melting	28.50-29.50
No. 1 bundles	34.50-35.50
No. 2 bundles	24.00-25.00
No. 1 busheling	34.50-35.50
Machine shop turnings	19.00-20.00
Mixed borings, turnings	24.00-25.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Low phos.	*35.00-36.00*
Cut structural plates 2 ft and under	42.00-43.00
Alloy free, short shovel turnings	28.50-29.50
Electric furnace bundles	35.50-36.50

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	38.00-39.00
Stove plate	44.00-45.00
Heavy breakable cast	34.00-35.00
Unstripped motor blocks	26.00-27.00
Brake shoes	33.00-34.00
Clean auto cast	45.00-46.00
Burnt cast	34.00-35.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt	*39.00-40.00*
R.R. malleable	*48.00-49.00*
Rails, 2 ft and under	50.00-51.00
Rails, 18 in. and under	51.00-52.00
Rails, random lengths	45.00-46.00
Cast steel	40.00-41.00
Railroad specialties	41.00-42.00
Uncut tires	44.00-45.00
Angles, splice bars	*47.00-48.00*
Rails, rerolling	55.00-56.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	240.00-250.00
18-8 turnings	110.00-120.00
430 clips, bundles, solids	90.00-100.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer's plant)

No. 1 heavy melting	*38.00-39.00*
No. 2 heavy melting	*34.00-35.00*
No. 1 bundles	*38.00-39.00*
No. 2 bundles	*29.00-30.00*
No. 1 busheling	*38.00-39.00*
Machine shop turnings	20.50-21.50
Short shovel turnings	26.00-27.00
Cast iron borings	26.00-27.00
Low phos.	38.00-39.00
Electric furnace bundles	38.00-39.00

Railroad Scrap

No. 1 R.R. heavy melt.	*40.00-41.00*

CHICAGO

No. 1 heavy melting	*36.00-38.00*
No. 2 heavy melting	*31.00-32.00*
No. 1 factory bundles	*38.00-39.00*
No. 1 dealer bundles	*36.00-37.00*
No. 2 bundles	*25.00-26.00*
No. 1 busheling	*36.00-38.00*
Machine shop turnings	20.00-21.00
Mixed borings, turnings	22.00-23.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Cut structurals, 3 ft	*39.00-40.00*
Punchings & plate scrap	*40.00-41.00*
Electric furnace bundles	*38.00-39.00*

Cast Iron Grades

No. 1 cupola	43.00-44.00
Stove plate	35.00-36.00
Unstripped motor blocks	30.00-31.00
Clean auto cast	*48.00-49.00*
Drop broken machinery	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt	*41.00-42.00*
R.R. malleable	46.00-47.00
Rails, 2 ft and under	51.00-52.00
Rails, 18 in. and under	52.00-53.00
Angles, splice bars	47.00-48.00
Rails, rerolling	*56.00-58.00*

Stainless Steel Scrap

18-8 bundles & solids	255.00-265.00
18-8 turnings	130.00-140.00
430 bundles & solids	100.00-105.00
430 turnings	45.00-50.00

Chicago Mercantile Exchange
(Week ended July 13)

	High	Low	Close
No. 1 Heavy Melting			
	High	Low	Close
Oct.	36.50†	36.00*	36.50*
Jan.	....	....	....

Sales (160-ton units): None.
*Nominal. †Bid.

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*32.00*
No. 2 heavy melting	*23.00*
No. 1 bundles	*33.00*
No. 2 bundles	*21.50*
No. 1 busheling	*32.00*
Machine shop turnings	*15.00*
Mixed borings, turnings	*15.00*
Short shovel turnings	*19.50*
Punchings & plate scrap	*36.00*

Cast Iron Grades

Charging box cast	28.00
No. 1 cupola	37.00
Stove plate	32.00
Heavy breakable	28.00
Unstripped motor blocks	20.00
Clean auto cast	42.00
Malleable	35.00

BIRMINGHAM

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	31.00-32.00
No. 2 bundles	23.00-24.00
No. 1 busheling	32.00-33.00
Cast iron borings	15.00-16.00
Short shovel turnings	24.00-25.00
Machine shop turnings	18.00-19.00
Electric furnace bundles	32.00-33.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	36.00-37.00
Structural plate, 2 ft	36.00-37.00
Unstripped motor blocks	35.50-36.50

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
Rails, 2 ft and under	44.00-45.00
Rails, 18 in. and under	45.00-46.00
Rails, rerolling	43.00-44.00
Rails, random lengths	40.00-41.00
Angles, splice bars	43.00-44.00
Std. steel axles	35.00-36.00

PHILADELPHIA

(Delivered consumer's plant)

No. 1 heavy melting	*39.00-40.00**
No. 2 heavy melting	*34.00-35.00**
No. 1 bundles	*39.00-40.00**
No. 2 bundles	*30.00-31.00**
No. 1 busheling	*39.00-40.00**
Electric furnace bundles	41.00
Machine shop turnings	23.50
Mixed borings, turnings	23.50
Short shovel turnings	26.00
Structurals & plate	41.00-42.00
Heavy turnings	34.00-35.00
Couplers, springs wheels	41.50
Rail crops, 2 ft under	50.00-51.00

Cast Iron Grades

No. 1 cupola	36.00
Malleable	45.00
Heavy breakable cast	42.00
Drop broken machinery	45.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	30.00-31.00
No. 1 bundles	34.00-35.00
No. 2 bundles	23.00-24.00
Machine shop turnings	15.00-16.00
Mixed borings, short turnings	16.00-17.00
Short shovel turnings	17.00-18.00
Low phos. (structural & plate)	36.00-37.00

Cast Iron Grades

No. 1 cupola	*32.00-33.00*
Unstripped motor blocks	*22.00-23.00*
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	*245.00-250.00*
18-8 borings, turnings	*120.00-125.00*
430 sheets, clips, solids	*105.00-110.00*
410 sheets, clips, solids	*85.00-90.00*

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	*23.00-23.50*
No. 1 bundles	*30.00-31.00*
No. 2 bundles	*21.50-22.00*
Machine shop turnings	*12.50-13.00*
Mixed borings, turnings	15.00-15.50
Short shovel turnings	*16.50-17.00*
No. 1 cast	*30.00-31.00*
Mixed cupola cast	*28.00-29.00*
No. 1 machinery cast	*33.00-34.00*

BUFFALO

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*29.00-30.00*
No. 1 bundles	*34.00-35.00*
No. 2 bundles	*26.00-27.00*
No. 1 busheling	*34.00-35.00*
Mixed borings, turnings	*23.00-24.00*
Machine shop turnings	*21.00-22.00*
Short shovel turnings	*24.00-25.00*
Cast iron borings	*23.00-24.00*
Low phos.	*37.00-38.00*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	*37.00-38.00*
No. 1 machinery	*42.00-43.00*

Railroad Scrap

Rails, random lengths	*39.00-40.00*
Rails, 2 ft and under	*44.00-45.00*
Railroad specialties	*39.00-40.00*

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*35.00-36.00*
No. 2 heavy melting	*31.00-32.00*
No. 1 bundles	*35.00-36.00*
No. 2 bundles	26.00-27.00
No. 1 busheling	*35.00-36.00*
Machine shop turnings	*20.00-21.00*
Mixed borings, turnings	*19.50-20.50*
Short shovel turnings	*23.00-24.00*
Cast iron borings	*20.00-21.00*
Low phos., 18 in.	40.00-41.00

Cast Iron Grades

No. 1 cupola	42.00-43.00
Heavy breakable cast	35.00-36.00
Charging box cast	36.00
Drop broken machinery	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	*37.00-38.00*
Rails, 18 in. and under	47.00-48.00
Rails, random lengths	41.00-42.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	30.00
No. 2 heavy melting	28.00
No. 1 bundles	30.00
No. 2 bundles	23.50
Machine shop turnings	15.00
Short shovel turnings	17.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	35.00
Heavy breakable cast	33.00
Unstripped motor blocks	33.00
Brake shoes	32.00
Clean auto cast	43.00
Stove plate	33.50

Railroad Scrap

No. 1 R.R. heavy melt.	34.50
Rails, 18 in. and under	46.00
Rails, random lengths	40.00
Rails, rerolling	51.00
Angles, splice bars	41.00

SEATTLE

(Delivered consumer's plant)

No. 1 heavy melting	33.00
No. 2 heavy melting	29.00
No. 1 bundles	25.00
No. 2 bundles	23.00
No. 3 bundles	16.00-17.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	15.00-16.00
Electric furnace, No. 1	39.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	36.00-40.00
Heavy breakable cast	28.00
Unstripped motor blocks	30.00-32.00
No. 1 wheels	24.00-25.00
Stove plate (f.o.b. plant)	28.00-29.00
Brake shoes	28.00-29.00

Railroad Scrap
(Delivered consumer's plant)

Rails, random lengths	34.00

LOS ANGELES

No. 1 heavy melting	30.00
No. 2 heavy melting	28.00
No. 1 bundles	29.00
No. 2 bundles	23.00
Machine shop turnings	8.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	32.00
No. 2 bundles	27.00
No. 1 busheling	32.00
Machine shop turnings	12.00
Mixed borings, turnings	12.00
Short shovel turnings	14.00
Cast iron borings	14.00
Cut structurals	34.00
Heavy turnings	12.00
Punchings & plate scrap	32.00

Cast Iron Grades

No. 1 cupola	40.00-43.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.

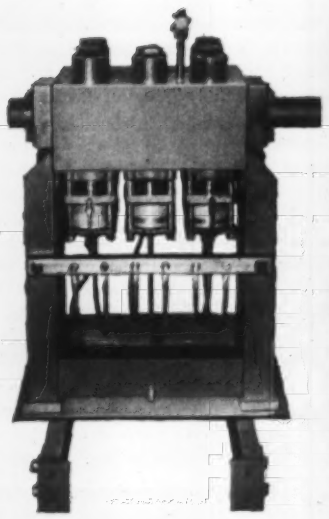
(Delivered prices)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	34.00
No. 2 bundles	28.00
Mixed steel scrap	28.00
Mixed borings, turnings	16.00
Rails, remelting	43.00
Busheling, new factory: Prepared	32.00
Unprepared	28.00
Short steel turnings	16.00

Cast Iron Grades†

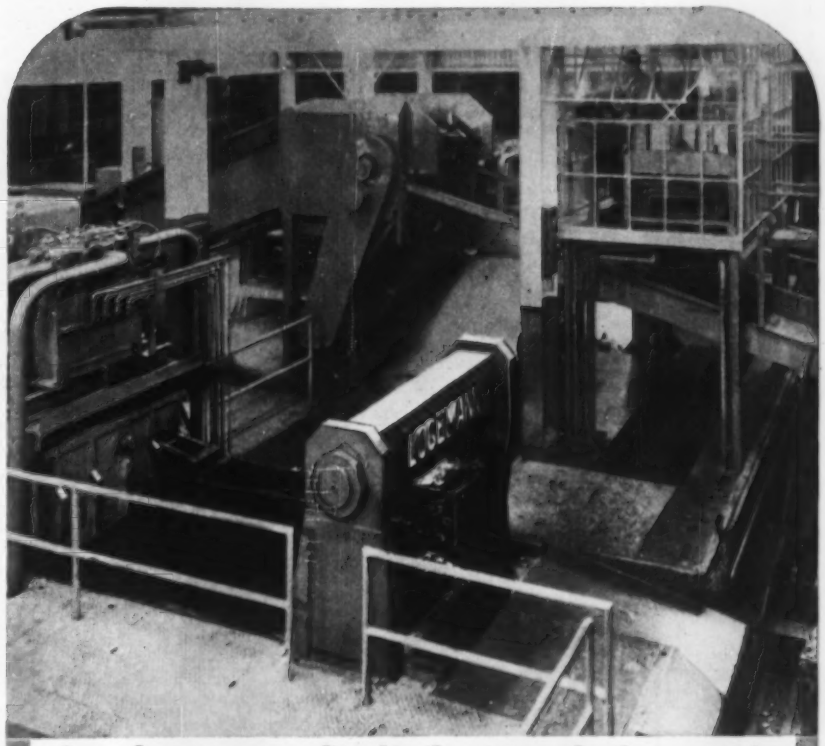
No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.



LOGEMANN HYDRAULIC OPERATING VALVE

This compact valve was designed to control the movements of the hydraulic rams in large scrap presses but can be modified to suit similar operations on other hydraulic equipment. Interested parties will please outline the nature of the service, operating sequence, gallonage and pressure requirements.



Get low cost, high density bales with LOGEMANN SELF-CONTAINED TRIPLE-COMPRESSION PRESSES

The illustration shows one of two large scrap-press units in a modern automotive plant. Over a period of many years, such units have baled sheet scrap skeletons and trim from metal operations in large industrial plants throughout the country, forming the scrap into high-density bales for re-melting in steel mills. Low baling costs are the result of correct design for heavy duty service, minimum maintenance and operating interruptions, as well as simplicity, accessibility and safety features.

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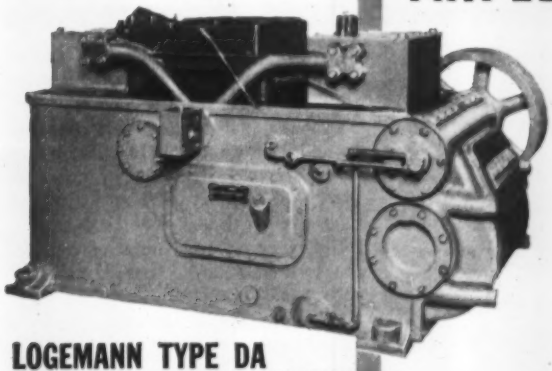

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LOGEMANN press sizes are not confined to the large models. Producers of sheet scrap—steel, copper, brass, or aluminum—are invited to submit their scrap baling problems regardless of tonnage. Please state the character of the metal, minimum tonnage to be handled in a given period of hours, range of gauges and, where possible, indicate maximum and minimum lengths and widths of pieces. Experienced sales engineers are available for discussion of your conditions and requirements.

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(*Concluded from page* 171)

Mexico and Utah dealers for export to Japan.

San Francisco—Steel scrap prices are expected to hold unchanged over remainder of the month at the recently established higher levels.

Seattle—Export influences apparently are holding up the scrap market in this area. Despite heavy receipts and other factors that ordinarily would contribute to weakness, the market continues strong. The leading buyer is placing business until July 15 on the present level of $33 and $29, respectively, for No. 1 and No. 2 heavy melting steel.

Shipments from the interior continue heavy, providing sufficient surplus for limited exports. The larger local buyers favor present high prices since they serve to deter exports.

Washington—Consumption of ferrous scrap during May totaled 6,425,000 gross tons, reports the Bureau of Mines. This was the largest monthly tonnage reported since March, 1953.

Stocks of ferrous scrap held by consumers at the end of May amounted to 6,500,000 tons, a slight increase over April tonnage.

Pig Iron . . .

Pig Iron Prices, Page 155

Republic Steel Corp. relighted a blast furnace at its Massillon, O., steelworks July 8 following one of the fastest relining jobs on record—37 working days.

Processed iron blast-furnace slag production totaled 29,235,142 net tons in 1954, reports the Bureau of Mines. This was off from the 30,511,603 tons produced in 1953.

Recovery of iron by slag producers totaled 302,000 tons, comparing with 353,833 in 1953.

Pig iron prices advanced $2.50 a ton at most furnaces last week. It was the first general advance since June, 1953, despite the rise in wages and other costs.

In announcing a new price schedule, C. T. Marshall, general manager, Coke & Iron Division, Pittsburgh Coke & Chemical Co., said the increase was made necessary not only by the recent wage increase, but also by the steadily mounting cost of purchased raw materials, goods and services.

Based on higher prices at Swedeland, Pa., the Philadelphia delivered prices are: $62.16 on basic, $62.66 on No. 2 foundry, $63.16 on malleable and $63.66 on bessemer. Low phos iron on the $2.50 advance at Steel-

ton, Pa., is $70.05, delivered Philadelphia.

Advances of $2.50 a ton increased New York delivered prices on No. 2 foundry iron to $46.78 and on malleable to $65.28. Newark, N. J., delivered prices now are $63.52 on basic, $64.02 on No. 2 foundry, $64.52 on malleable and $65.02 on bessemer.

One of the exceptions to the general advance is the Chester, Pa., furnace which is quoting $7.50 below the new price levels. Decision as to further advance by that producer is under consideration.

Under the new price schedule, foundry and malleable iron, f.o.b. Neville Island, Pa., is $59.

Demand for pig iron continues adversely affected by vacations.

Iron Ore . . .

Iron Ore Prices, Page 165

The lake fleet hauled 3,027,287 gross tons of Lake Superior iron ore in the week ended July 11, the largest weekly tonnage moved to date in the 1955 shipping season. It was 400,000 tons greater than in the like week a year ago and brought the cumulative total for the season to July 11 to 32,388,041 tons, more than 6 million tons above shipments in the corresponding period of 1954.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2450 tons, transmission towers, Bonneville Power Administration, to Bethlehem Pacific Coast Steel Corp., Seattle, low at $604,311.

1655 tons, 13 bridges, Massachusetts turnpike, Hopkinton-Westboro-Southboro-Ashland and Framingham, Mass., to Truscon Steel Division, Republic Steel Corp.; Boston.

450 tons, Pennsylvania railroad Monument St. bridge, Baltimore, through McLean Contracting Co., that city, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

225 tons, plant building, Alco Products Inc., Latrobe, Pa., to Belmont Iron Works, Eddystone, Pa.

225 tons, girls' college dormitory, Elizabethtown, Lancaster county, Pa.; bids closed July 15.

165 tons, airplane hangar, New Castle, Del., to Delaware Valley Steel Co., Wilmington, Del.

118 tons, also 45 tons of reinforcing, plant addition, Chugach Electric Association, Knik Arm, Alaska, to Leckenby Structural Steel Co., Seattle; Schmid Construction Co., Seattle, general contractor.

STRUCTURAL STEEL PENDING

5000 tons, office building, State Mutual Assurance Co., Worcester, Mass.

3500 tons, grade crossing elimination, Boston & Maine railroad, Salem, Mass.; bids Aug. 9, State Department of Public Works, Boston.

2155 tons, steel sheet piling; also 965 tons of steel bearing piles, Tarrytown-Nyack bridge, Hudson river, New York; bids in direct to New York State Thruway Authority.

1650 tons, alterations and expansion, state bridges, Philadelphia; bids Aug. 26.

555 tons, three bridges, interchange, Massachusetts turnpike, West Springfield, Mass.

150 tons, stoplogs, etc., fish facilities, Bonneville dam; Funston Construction Co., Portland, Oreg., low at $49,854, to U. S. Engineer, Portland.

150 tons, two bridges, Klickitat county, Washington; West Coast Steel Works, Portland,

WANTED

By Eastern Electric Steel Foundry, SALESMAN, SALES ENGINEER, or JUNIOR SALES EXECUTIVE capable of assuming responsibilities and duties of sales manager within five years. Must have practical knowledge of steel foundry operations. Preferred age 35-45. Submit detailed resume with reply.

Reply Box 281, STEEL

Penton Building Cleveland 13, Ohio

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Kaiser Steel Corporation has excellent opportunity for Staff Engineer at Fontana, California, plant. Position requires Mechanical Engineering degree with experience in iron and steel production division including design of coke plant and by-product facilities. Excellent working and living conditions in Southern California. Please send resume giving personal history, age, education, experience and salary requirements to Employment Manager, Kaiser Steel Corp., P.O. Box 217, Fontana California. Replies confidential.

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Corporation
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Oreg., low at $34,140 and $10,789, respectively.

100 tons, 2-span stringer bridge, Lancaster, Mass.

REINFORCING BARS . . .

REINFORCING BARS PLACED

540 tons, high school, Butte, Mont., to Soule Steel Co., Portland, Oreg.

130 tons, missile launching project, Vashon Island, Washington, to Bethlehem Pacific Coast Steel Corp., Seattle; John H. Sellen Construction Co., Seattle, general contractor.

100 tons, utilidor projects, Alaskan air bases, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

116 tons, bridges, King county, Washington state; A. J. Cheff Construction Co., Seattle, low at $76,832.

100 tons plus, Oregon state road work; Malheur county, bridge, to Nielson & Smith, Twin Falls, Idaho, low at $108,655; Multnomah county subway pass, General Construction Co., Portland, Oreg., low at $38,483; Yamhill county bridge, Berkemeir Construction Co., Milwaukee, low at $38,443.

100 tons plus, Idaho state road project, Fremont county, 383-ft bridge; Duffy-Reed Construction Co., Twin Falls, Idaho, low.

100 tons plus, Montana state road projects; Silver Bow county, 161-ft overpass to C. H. Ellis Construction Co., Pocatello, Idaho, low at $44,522; Valley county, 360-ft bridge, Milk river, to Holm Construction Co., Glendive, Mont., low at $188,720.

485 tons, three bridges, interchange, Massachusetts turnpike, West Springfield, Mass.

80 tons, 500-ft disposal tunnel, Hanford Works; general contract to Sound Construction & Engineering Co., Seattle, low at $248,296.

Unstated, including 30 tons of reinforcing, also shapes and plates; log dump unit, Coos Bay, Oreg.; bids in to the Bureau of Public Roads, Portland, Oreg., July 12.

PLATES . . .

PLATES PLACED

600 tons, reservoir supply line, Tacoma, Wash., to American Pipe & Construction Co., Portland, Oreg., low at $157,820; installation contract for 9800 feet of Thorn & Marble, Seattle, low at $156,903.

PLATES PENDING

Unstated, 4540 feet of water line, 48 and 54-in. diameter, Hanford Works; Harold Kaeser Co., Seattle, low at $165,250 to the Atomic Energy Commission.

PIPE . . .

CAST IRON PIPE PLACED

200 tons (previously reported 100 tons) 16-inch supply line to Pacific States Cast Iron Pipe Co., Seattle, by Bremerton, Wash.

1360 tons, 12 to 4-inch, District No. 93, Mercer Island, Wash., to U. S. Pipe & Foundry Co., Seattle.

CAST IRON PIPE PENDING

500 tons, 16-inch, local improvement; bids in at Portland, Oreg., July 13.

Unstated, 3600 feet of 8-inch, 13,000 feet of 6-inch, and 31,000 feet of 4-inch; bids to C. P. Ballard, secretary, District No. 65, Alderwood Manor, Washington, July 25.

RAILS, CARS . . .

LOCOMOTIVES PLACED

State Railways of Thailand, fifteen 1000-hp diesel-electric locomotive units, to the Davenport-Besler Corp., Davenport, Iowa.

RAILROAD CARS PLACED

Canadian National, 30 fifty-ton steel sheathed express refrigerator cars to Marine Industries Ltd.

RAILROAD CARS PENDING

State Railways of Thailand, 838 one-meter gage freight cars, including gondolas, box cars, flat cars and stock cars; bids asked. Specifications available through the Commercial Intelligence Division, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington.

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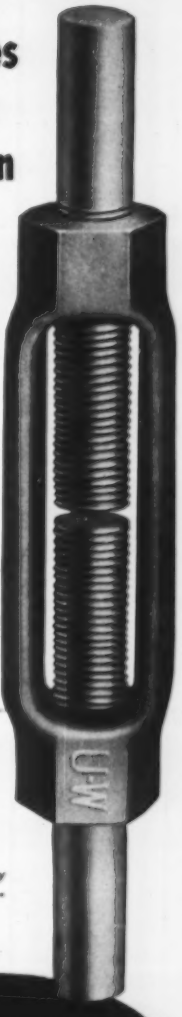
UPSON-WALTON

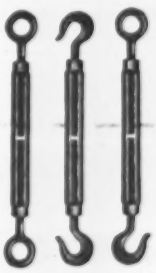
turnbuckles you can depend on



Weldless, hex-end bodies are drop forged from special bar quality forging steel.

Heads are drilled and tapped in perfect alignment, so that end fittings pull evenly.

Threading is American National Course series, class 2 fit, for easy assembly.



In the long run quality costs less. Specify Upson-Walton turnbuckles.

ENGINEERED FOR SAFETY

For prompt service call your U-W Distributor. Write for free catalog on wire rope fittings.

THE UPSON-WALTON COMPANY

12500 ELMWOOD AVENUE
CLEVELAND 11, OHIO

New York • Chicago • Pittsburgh

MANUFACTURERS OF TACKLE BLOCKS, WIRE ROPE, ROPE FITTINGS • ESTABLISHED 1871

Delivery when promised . . . dependability in every piece . . . and economically produced in stainless steel

on Carlson Order No. 17656

Not every shipment is as diversified as GOC 17656 but it illustrates the typical all-around service in stainless steel available from G. O. Carlson, Inc.

There are plates, heads, rings, circles, flanges, bars and rounds—all stainless steel to chemical industry standards—all made to match the specifications on the customer's blueprint. It took special equipment to make up this order—equipment designed and built by Carlson engineers who work *exclusively* in stainless.

This equipment in the hands of Carlson specialists *lowers* costs. You pay no freight on material you can't use and you save man-hours in easier fit-up, because the material is ready for fabrication when you get it.

When you order your stainless steel from G. O. Carlson, Inc. you can be sure of three things: (1) it is economically produced from the highest quality material; (2) it is cut to your specifications; (3) it is shipped on time. Write *right now* for complete information.

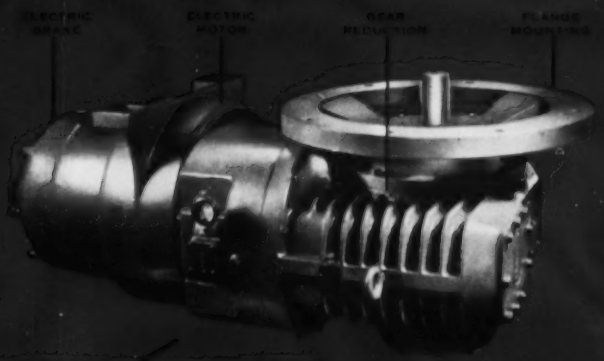
Stainless Steels Exclusively

G. O. CARLSON, INC.

THORNDALE, PENNSYLVANIA

Plates • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)

District Sales Offices in Principal Cities



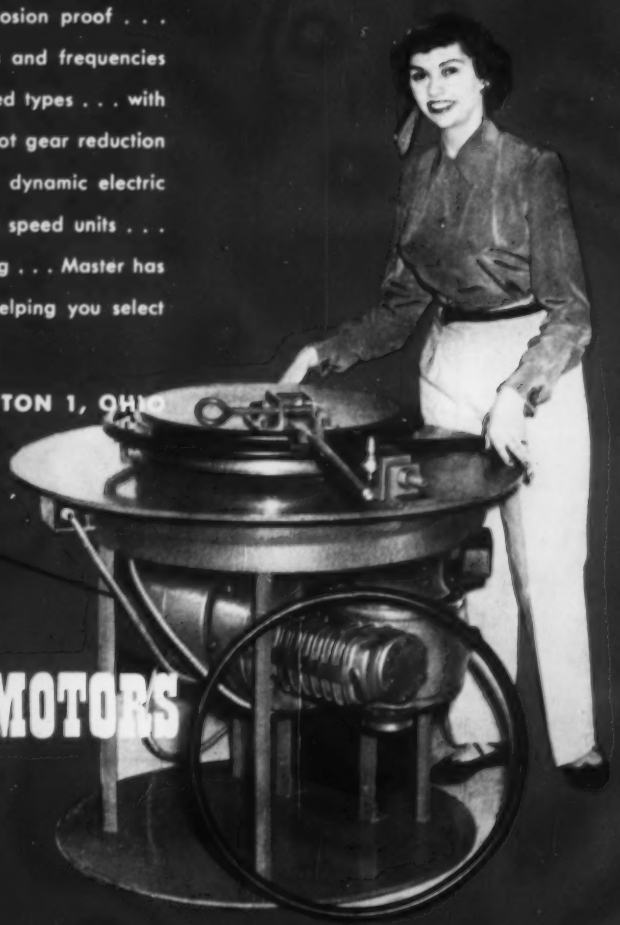
You can't beat the combination of the RIGHT horsepower, the RIGHT shaft speed, the RIGHT features all in one compact power unit that you can use RIGHT where you want it. It's the best way and the easiest way to select your power drives because you purchase one unit, handle one unit in your receiving, production, or maintenance departments . . . set one unit in place and you're ready to go.

Master Motors, available in thousands and thousands of types and ratings (⅛ to 400 HP) give you the widest selection of electric motor drives in the nation.

Open, enclosed, splash proof, fan-cooled, explosion proof . . . horizontal or vertical . . . for all phases, voltages and frequencies . . . in single speed, multi-speed and variable speed types . . . with flanges or other special features . . . with 5 types of gear reduction up to 432 to 1 ratio . . . with either magnetic or dynamic electric brakes . . . with mechanical or electronic variable speed units . . . with fluid-drives . . . and for every type of mounting . . . Master has them all and so can be completely impartial in helping you select the one best motor drive for YOU.

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO

make it easy for yourself



MASTER ELECTRIC MOTORS

86" flying shear cuts 1/16" to 1/2" sheets or plates at 1550 ft. per minute... *with help of TIMKEN® bearings*

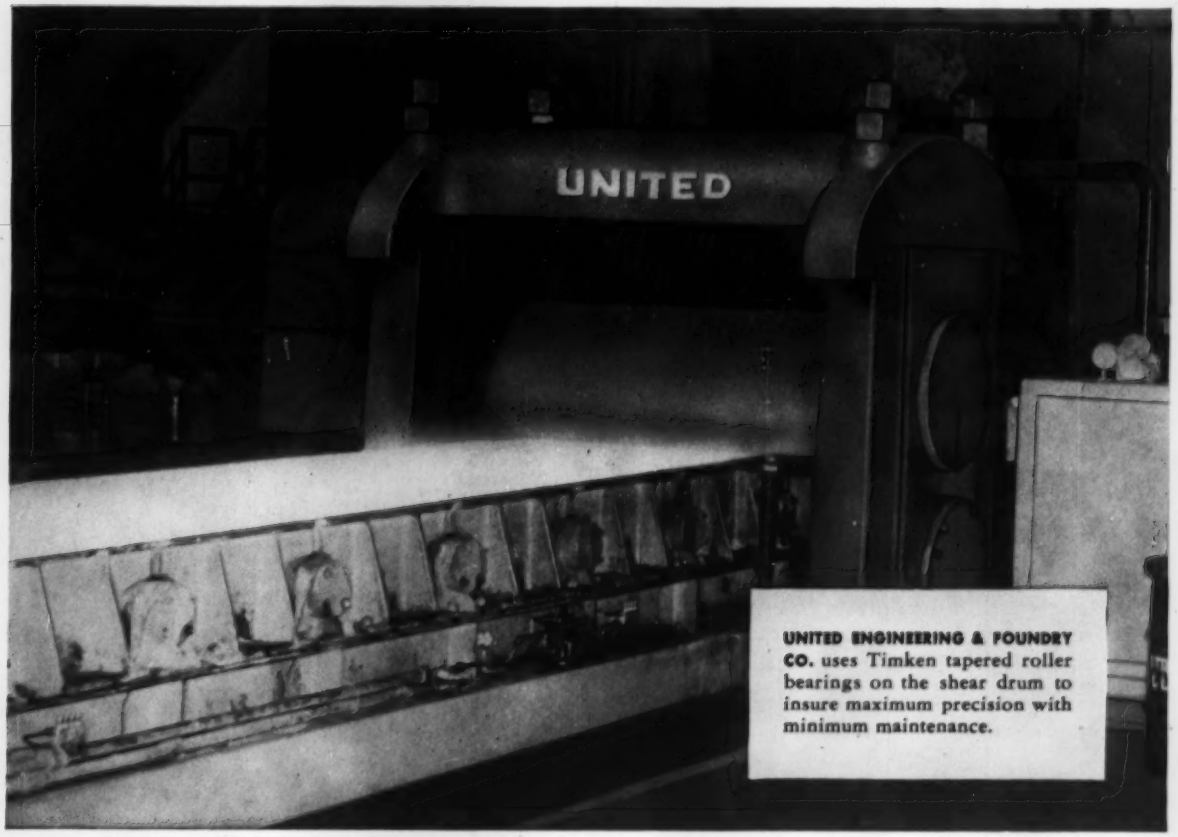
THE 86" flying shear on this hot strip mill at the Kaiser Steel Corporation's Fontana Works accurately cuts 1/16" to 1/2" thick sheets or plates into 20 to 60 foot lengths. Although the strip is moving as fast as 1550 feet per minute, the shear holds consecutive sheets or plates to extremely close length limits. To insure this accuracy with minimum maintenance, United Engineering & Foundry Co. mounted the shear drum rolls and drive gears on Timken® tapered roller bearings.

Timken bearings in the shear drum rolls take the terrific shock loads of the shearing operation. Their case-hardened rollers and races have tough, shock-resistant cores.

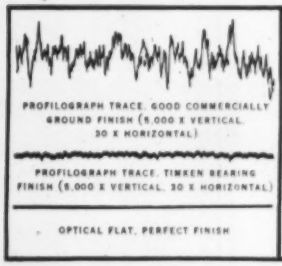
Specially designed gears regulate the length of cut in 1/4" steps. Timken bearings keep the gears in accurate and positive alignment. And Timken bearings' tapered construction lets them take any combination of radial and thrust loads. They take the heavy thrust of the helical gears with ease. They also locate all of the shafts in this intricate gear train.

Be sure to specify Timken bearings in the machines you build or buy. Look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



UNITED ENGINEERING & FOUNDRY CO. uses Timken tapered roller bearings on the shear drum to insure maximum precision with minimum maintenance.


PROFILOGRAPH TRACE, GOOD COMMERCIALLY GROUND FINISH (5,000 X VERTICAL, 30 X HORIZONTAL)
PROFILOGRAPH TRACE, TIMKEN BEARING FINISH (5,000 X VERTICAL, 30 X HORIZONTAL)
OPTICAL FLAT, PERFECT FINISH

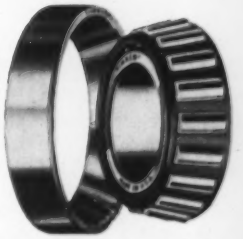
SMOOTH TO MILLIONTHS OF AN INCH

Surface finish of high quality Timken bearing rollers and races is so smooth that it takes a profilograph to measure its smoothness. This instrument measures surface variations to a millionth of an inch, as shown at the left.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL — NOT JUST A ROLLER — THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST — LOADS OR ANY COMBINATION